THE EFFECT OF MULTIPLE INTERVENTIONS ON FRESHMAN COLLEGE STUDENT ENGAGEMENT AND RETENTION

by

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ABSTRACT

PETER ALBERT LEHMULLER. The effect of multiple interventions on freshman college student engagement and retention. (Under the direction of DR. JOHN A. GRETES)

College student retention has been widely studied in the past twenty five years, and institutions have developed numerous interventions aimed at improving student retention and persistence-to-degree. A number of theories have been promulgated to explain student departure. While none has proven absolutely conclusive, the concept that student engagement influences the decision to stay enrolled or depart the institution has achieved an almost universal acceptance. Most institutional programs aimed at improving retention seek to engage students on academic and social levels, following the theory that the more a student is connected to the institution, the more likely the student is to stay, and hence, graduate. Much research has been completed attesting to the efficacy of a variety of single interventions. This study determined if participating in more than one intervention significantly improves engagement and retention. Results indicated that participating in more than one intervention significantly improves retention, and that participation in an extended orientation when combined with a learning community with an embedded first-year seminar was the most effective combination. Analysis also demonstrated a relationship between engagement, expressed as the quality of interactions a student has with the institution, and retention.

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It's over.

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CHAPTER 1: INTRODUCTION

College student retention has been widely studied in the past twenty five years, and institutions have developed numerous interventions aimed at improving student retention and persistence-to-degree (Seidman, 2005). Yet the problem of retaining students remains and understanding the reasons for student departure are still unclear (Braxton & Hirschy, 2005). While there are a number of theories as to why students leave college, research has not proven conclusive for any single theory across all types of institutions and/or students. Many college student retention programs appear to apply a common sense approach, using bits of different theories, which might be summed up as a general supposition that a student's academic ability combined with his commitment to attending college and his involvement while at college will determine his ability to "engage" with the institution. From this perspective, the more a student engages with the institution, both academically and socially, the more likely he is to graduate. Thus institutional efforts to improve retention might be summarized as programs which enable the student to attain their academic and personal goals and permit the institution to fulfill its mission and purposes (Seidman, 2006).

Regulatory bodies regard first-year retention and persistence-to-degree (graduation rates) as means of assessing institutional effectiveness (Hopkins, 2007). Only two-thirds of college students entering a baccalaureate program graduate within six years of initial enrollment (United States Department of Education, 2006), and there is growing

demand that colleges be held accountable for what is perceived by the public as a relatively low success rate (Bill & Melinda Gates Foundation, 2009). Colleges themselves are interested in improving retention because, among other things, the costs associated with recruiting a new student (private schools spend more than $2000 per student on recruiting [Noel-Levitz, 2006]) are much greater than keeping one in school (Dickeson, n.d.).

Research and scholarship has focused on theory promulgation and criticism as well as studies of the effectiveness of a variety of interventions at different institutions, both of which will be discussed in Chapter Two. For now, it is important to note that the theoretical work of Vincent Tinto and Alexander Astin are important to understanding the retention efforts at the institution under study. While both the Tinto and Astin models find at least partial support in Pascarella & Terenzini's 2005 review, not all of the work is supported by the resulting research. Schnell & Doetkott (2003) suggested that utilizing Tinto *and* Astin provides a strong theoretical framework for both understanding the causes of student departure, and for developing programs which help students stay in school. The theories of Tinto and Astin inform the model for the freshman retention program at the institution under study.

Pascarella and Terenzini (2005) noted that pre-1990s scholarship supported the notion that "specific college experiences promote student persistence" (p. 395) and that academic and social engagement had positive effects. Since the 1990s, the demand for institutional accountability in retention and persistence resulted in a great deal of study of the effectiveness of programs designed to improve both (Pascarella & Terenzini).

However, the research is generally limited to studies of single factors (e.g., first year seminars); both an ERIC search and search of Dissertation Abstracts International revealed only one study (Keup, 2006) where institutional interventions were analyzed for potential compounding effects on retention. The focus of this study was to analyze three distinct interventions in a variety of combinations to see which, if any, combination produced better than expected gains in engagement and retention.

Purpose of the Study

The study investigated if a series of interventions used by the institution to improve student engagement and first-year retention rates have a compounding effect upon one another. Specifically, the study attempted to identify if the combination of student attendance at an intensive orientation prior to enrollment, when combined with enrollment in an organized first-year seminar and/or participation in a learning community, led to improved student engagement and retention compared to students who participate in those activities either singly or not at all. Pascarella & Terenzini (2005) noted that these factors have small but measurable effects on an individual basis. Just as compound interest on a savings account will yield larger gains than simple interest, this project expanded the knowledge base by linking the interventions to see if combinations are more beneficial than singular efforts.

The study addressed the following research questions:

1) Are student characteristics such as gender, race, projected grade point index (PGI), commuter status, and hours worked per week predictive of engagement and first-to-second year retention?

2) Is there a relationship between participating in the selected institutional interventions and levels of student engagement?

3) Is there a relationship between participating in the selected institutional interventions and first-to-second year retention?

4) To what extent does participation in more than one of the selected institutional interventions affect engagement and retention?

5) Is there a relationship between level of engagement and retention?

Astin (1996) posited that while the institutional environment was important, positive outcomes result more from student effort; this would imply that student commitment is critical for retention and, ultimately, persistence. Put another way, student efforts to succeed in college are important, and the college has to have programs and activities that provide a positive outlet for those efforts.

The research questions began with student characteristics. Astin and Oseguera (2005) wrote that there was ample evidence to indicate that pre-college characteristics like gender, ethnicity, socio-economic status, or academic ability predict a better or worse chance of student persistence. Tinto (1987) says much the same thing, but Braxton and Lee (2005) reviewed the research and could not state that this was reliably true, although Pascarella & Terenzini (2005) felt that Braxton and Lee may have been too harsh. In any event, Braxton and Lee were not evaluating the validity of the theory, only the reliability of the research based upon the theory. DeBerard, Spielmans, and Ulka (2004) identified 10 predictor variables which accounted for 56% of the variance in academic achievement, but failed to find statistical significance as predictors of retention.

Therefore, a set of student characteristics will be used to describe the population in general and to make between-group comparisons when analyzing the outcomes of engagement and retention.

The second part of the research was informed by Tinto's theory of student departure. The theory suggests that a student's initial commitment to graduation, both in general and from the chosen institution, is affected by the institution's efforts to increase student academic and social integration. As the student develops psychologically, increases in engagement increase the student's subsequent commitment to graduating. The interventions to be studied are designed to increase a student's connection to the institution; therefore it is reasonable to ask if the programs do, in fact, increase engagement, as measured by voluntary student response to the National Survey of Student Engagement (NSSE).

The third part of the study addressed whether or not there are compounding effects from completing more than one of the programs. To do this, the interventions were analyzed individually first, then in combination with one another. Finally, the study analyzed whether increased student engagement was associated with increased retention.

Research Problem and Design

College student retention remains an issue of vital interest to all the constituent groups in higher education, from institutions and regulatory agencies to parents and students themselves. Astin and Osegura (2005) noted that retention research has two goals: the first is that institutions would like to be able to predict the likelihood that a student will return for a second year and persist to their degree. The second is to exercise control over the conditions that affect a student's chances for success. This study

evaluated the effectiveness of activities that attempt to do both (predict and control) at the institution in question. The study met several of Glatthorn and Joyner's (2005) tests of professional significance for a study in that (a) the problem has an intrinsic importance, (b) previous research is not fully conclusive, (c) the study examines the implementation of theory that is widely accepted and will be tested in a new way, and (d) if meaningful results are obtained, those results would be of interest and value to practitioners. The results of this inquiry have the potential to inform policy decisions relative to institutional efforts to improve retention and persistence. At present, neither the existing scholarship nor the results of the interventions can provide an answer as to the value of these interventions working in concert, despite the significant resources required to run them all.

The study was conducted at a large public institution in the southeastern United States. The population studied was the incoming freshman class entering for the first time in the fall of 2008. From that pool of approximately 3000 new students, only those who were first-time, full-time college students were studied. Most retention studies are done at single institutions (Crissman-Ishler & Upcraft, 2005), and both Tinto and Astin wrote from the perspective that student retention was largely an individual decision that occurs over time while the student engages with the particular institution. Thus, testing of these theories would logically be limited to single institution studies. As Braxton & Lien (2000) pointed out, Tinto did not propose a systems theory, so testing at individual institutions is appropriate.

Interventions

The institution undertakes a wide variety of activities designed to improve freshman retention through increasing student engagement, both academically and socially. Interviews with student affairs and academic professionals on campus revealed that the retention practices on campus are informed by the theoretical work of Tinto and Astin, and that staff charged with developing, implementing, maintaining, and assessing the programs are familiar with the theoretical underpinnings of the activities (A. Blattner; C. Blattner; T.W. Elling; L. Fitzgerald; D. Weise; personal communications, June 2009). Individual retention activities are not discrete events, but rather part of a system of efforts, grounded in theory, to improve the student experience and increase retention and persistence. The three interventions to be studied are presented at Table 1 and described in more detail later.

Table 1

Summary of Interventions

Intervention	Description
"SOAR"	Pre-matriculation two-day acculturation program
Freshman Seminar	Fall-term course to increase social/academic engagement
Learning Communities	Year-long program to increase academic/social engagement

The interventions selected for this study were chosen because they have a deep basis in the theoretical work. Notice that the three interventions occur across time, from pre-enrollment through the end of the first year. This reflects Tinto's theory that the student departure decision occurs over time, and includes three psychological stages-

separation, transition, and incorporation. Failing to bridge the stages of development will result in a decision to leave the institution. The interventions will be discussed in more detail in Chapter Two.

Methodology

The entire freshman population was available for study, but the analysis was after the interventions had an effect (or did not) on the dependent variable, which is retention. A between-groups analysis is required, with entry characteristics used to describe relative homogeneity of the groups. Entry characteristics are necessary both from a theoretical standpoint and because the first intervention preceded the student's first day in class. Descriptive statistics, parametric (where appropriate) and non-parametric tests were used to analyze the association between participation in the interventions and engagement and multi-variate analysis of variance to analysis the relationship between engagement and retention.

Delimitations and Limitations

The study is delimited by the single institution and the size of the class of 2008. Only first-time, full-time students were studied, a population of slightly more than 3000 students. Between-group homogeneity is described through the use of student characteristics such as Predicted Grade Point Index (PGI), residential/commuter status, gender, race/ethnicity, self-reported number of hours worked, and unmet financial need. These data were readily accessible to the researcher.

The study was limited by its reliance on data collected from a single institution, and from a single cohort of its freshman students. It was also limited by the lack of random assignment to the different interventions, and by student self-reporting on the

survey. In addition, because students cannot be kept in isolation by the groups identified in the study, there may be confounding effects as students in learning communities, for example, interact with students in freshman seminar. Too, the construct of student engagement is psychologically complex and fairly abstract, and the proxy selected to gauge the level of commitment may be a somewhat crude estimation of actual engagement.

Definitions

The interventions studied have a variety of meanings across institutions. For purposes of this investigation the following definitions apply (the programs themselves are described more fully in Chapter Two):

Student Orientation, Advising and Registration (SOAR)

A summer pre-matriculation program coordinated by Student Affairs, designed to provide new students with a comprehensive and coordinated introduction to the institution, preparing them for success in the first semester through information and confidence building.

Freshman Seminar

A program offered by Academic Affairs, designed to assist new students with undeclared majors. All undeclared students are strongly encouraged to take freshman seminar, while students enrolled in major fields of study may elect to take freshman seminar or get the elements of it in other college-specific programming, including (but not limited to) college-based learning communities. For this study, students identified as taking freshman seminar only are those students enrolled in the freshman seminar classes who are not part of a learning community.

Learning Communities

Academic Affairs offers learning communities as a research-based method of increasing student academic engagement through small and supportive learning and living arrangements. The one-year learning communities are generally designed for residential students, although the institution offers a single commuter learning community and not all learning communities have a residency requirement.

Other terms requiring clarification:

Engagement

For the purposes of this study, student engagement will be measured by a student's voluntary responses to items on the *National Survey of Student Engagement* (NSSE). The survey is administered nationally on an annual basis and hundreds of institutions participate. It is designed to provide information about the student experience at the particular college, both academically and socially (National Survey of Student Engagement, 2009). The institution studied administers NSSE every other year; the freshman class of 2008 received the opportunity to participate in the spring of 2009. The specific items selected as proxies for engagement will be discussed more fully in Chapter Three.

Retention

The United States Department of Education Integrated Postsecondary Data Set (IPEDS) defines retention as the rate at which first-time, full-time students seeking a bachelor's degree return the following fall.

Unmet Need

This number is calculated by the institution and indicates the cost of education after financial awards, family contributions, and student earnings are subtracted from the total cost of tuition, fees, and related costs of enrollment (Pascarella & Ternezini, 2005). As unmet need increases, student retention and persistence decline.

Predicted Grade Point Index (PGI)

The Predicted Grade Point Index is used by the Admissions department to anticipate a potential student's freshman academic success. It is calculated in two different ways, depending on whether or not the student attended a public high school in the state in which the institution is located. In either case, the student's high school GPA and SAT scores are used and adjusted for participation in honors programs, Advanced Placement courses, or International Baccalaureate programs. The institution reported that students with PGIs of 3.6 or greater were statistically likely to succeed academically and that there was a corresponding drop off in retention and academic performance for those students below 3.6.

Participation Rate

The number of students enrolled in the particular intervention or responding to the survey is the participation rate. It may also be expressed as a percentage of the total population.

Graduation Rate

The rate reported by institutions to the United States Department of Education of the number of students completing (receiving a degree or diploma) within 150% of the

normal time frame divided by the number of the adjusted cohort for a particular entry date.

Summary

Assessing the effectiveness of programming based upon institutionally accepted theory and building upon existing research, this study attempted to determine if institutional interventions aimed at improving first year retention have a compounding effect upon student engagement and retention. Bean (2005) noted that because the departure decision is so complex, it is difficult to point to a single program and declare it to be definitive in improving retention. The study used entry characteristics identified in previous work as predictive of success to describe the differing groups of students who are involved in the retention efforts and who respond to a national survey that helps determine levels of engagement. Theory holds that increases in engagement should increase retention; the study attempted to determine if this was true at the particular institution. Finally, the study used statistical analysis to determine if students attending multiple interventions were more likely to be retained than might be expected by chance.

The theories and previous research will be explored in greater detail in Chapter Two. Chapter Three will describe the variables, population, data sources, and methodology to be used in the analysis, while Chapters Four and Five will present the results and a discussion of those results.

CHAPTER 2: REVIEW OF THE LITERATURE

College student retention became a focus of study as a result of the rapid expansion in overall college enrollment in the period after World War II. In an historical review of retention, Berger and Lyon (2005) noted that individual colleges began limited efforts at monitoring student persistence in the 1950s, and that early research culminated in Spady's 1971 model of student dropout, which posited that a combination of individual student characteristics and institutional systems resulted in a decision to stay or leave. It was Spady's model that Tinto originally built upon in the mid-1970s.

As retention research grew in the 1970s and 1980s, a new concept, enrollment management, came into being, as a way of addressing the leveling off of student enrollment after the explosive growth of the 1960s (Berger & Lyon, 2005). Enrollment management linked admissions and retention efforts for the first time (through the use of predictor variables), while large increases in the diversity and readiness of the college student body required a means for institutions to maintain their size. Today, retention is considered a key indicator of institutional effectiveness that institutions both report to the U.S. Department of Education and that consumer guides use to determine college rankings. Importantly for this study, the research has shifted "from predictions based on individual characteristics…to those institutional characteristics and experiences that are correlated

with the probability of being retained" (Hendel, 2001, p. 4). Because understanding the theoretical foundations of retention programming is important (Strayhorn, 2009), the next section will briefly review the two main theorists whose work undergirds the retention efforts at the institution featured in the study.

Theories of Student Departure

Vincent Tinto

The work of Vincent Tinto enjoys "near paradigmatic status" (Braxton & Lien, 2000), and it is foundational at the institution that was the subject of this particular study. Retention, according to Tinto (1987), is not so much an institutional goal but rather the result of efforts the institution makes to assist the student transition to college life. Students must be academically and socially integrated into the institution in order to succeed. More recently, Tinto (2000) wrote that colleges need to create environments that improve retention, rather than simply offer courses that "inoculate" students against dropping out. There is a significant body of research detailing the interaction of people with their environment and how that interaction influences behavior. While there are several models that view behaviors through this lens, the one most germane to this study is personal development, which posits that as students gain experience and confidence in a particular environment (in this case, college), external controls (institutional interventions) give way to self-direction and definition (the decision to persist and graduate) (Pascarella & Terenzini, 2005).

Briefly stated, Tinto's theory holds that as students make their way through the collegiate experience, the combination of pre-college attributes the student brings and the interactions the student has with the academic and social communities after enrollment

impact the student's decision to stay or depart. Using psychology as a framework, Tinto posited that in order to graduate, students had to separate from their previous lives, then transition towards and finally incorporate into, a new collegiate life. Student retention was always a concern of colleges, particularly after increases in dropout during the 1960s and Tinto's theory provided a framework for understanding the causes of student departure and a springboard for programming designed to improve retention.

Tinto noted that in order to be successful, a student must be committed to graduating from college *in general* as well as committed to graduating from the chosen institution *in particular*. Students with higher levels of initial commitment are more likely to persist, therefore pre-college attributes are important. However, once enrolled, all students needed assistance transitioning to collegiate life. These efforts would reinforce the student's subsequent commitment to graduating and therefore increase retention and persistence. Institutional efforts were required to assist the student "engage" the academic and social communities on campus: students who are academically successful are more likely to graduate, and students who are socially integrated are more likely to stay. While subsequent research (Allen, 1999; Braxton & Hirschy, 2005; Cabrera, Burkum & LaNasa, 2005; Elkins, Braxton & James, 2000) has challenged Tinto's theory as limited to traditional-aged, residential students at four-year institutions and not inclusive for the modern economic and social composition of student bodies, the sheer number of citations of his theory in the literature demonstrates its power and longevity.

Alexander Astin

Astin's theory of student involvement is the second piece of the theoretical puzzle in this study. "Involvement" in this case means the amount of physical and psychological energy a student expends in the academic experience (Siedman, 2006). An involved student spends time on campus, studies regularly, is active in student organizations, and interacts with faculty and other students (Astin, 1984). The theory postulated that student involvement is a continuum with both qualitative and quantitative elements, and that the amount of student learning is directly related to the amount and quality of student involvement. By scaling involvement along a continuum, dropping out is seen as the ultimate in non-involvement and graduation is the ultimate outcome. Logically, then, effective educational policy is policy that increases student involvement.

While both the Tinto and Astin models find at least partial support in Pascarella & Terenzini's (2005) review, not all of the work is supported by the resulting research. Braxton, alone and in combination with other researchers, has raised a number of criticisms of Tinto's theory. Bailey and Alfonso (2005) argued that the theory (and retention research in general) is limited because it is focused on traditional-aged, middle-class, residential students, a claim echoed by Kelly (2008). The student body makeup has changed enormously, as has the enterprise of higher education, since Tinto first promulgated his theory in the mid-1970s. Economics plays a much larger role in the literature of retention (Schuh, 2005; St. John, Cabrera, Nora & Asker, 2000) today than just twenty years ago, and the explosion in student diversity in the past generation has given rise to an entire new sub-field of retention scholarship (e.g., Nora, Barlow & Crisp, 2005). However, the theory makes intuitive sense; Schnell & Doetkott (2003) and

Koerner (2008) suggested that utilizing Tinto *and* Astin provides a strong theoretical framework for both understanding the causes of student departure, and for developing programs which assist students to stay in school. The theories of Tinto and Astin inform the model for the freshman retention program at the institution under study.

Empirical Research

Student Characteristics

Students leave colleges for many reasons. Kuh, Cruce, Shoup, Kinzie, Gonyea (2008) reported that recent research into student departure and retention has moved beyond the basic interaction between the student and the institution. Modern retention research must consider student demographic and pre-college experiences, characteristics of the institution itself, as well as (importantly) student perceptions of the learning environment and interactions between students and faculty (Kuh et. al, 2008). This study has identified five characteristics that provide the context for analysis of the effectiveness of the institutional interventions designed to improve retention. Understanding the background variables of gender, ethnicity, PGI, residency status and hours worked add subtlety and color to the more straightforward question of whether interventions increase engagement and retention.

Gender

Pascarella and Terenzini (2005) reported on gender differences in rates of retention and graduation by looking at the research surrounding women's colleges. They concluded that women have very different experiences at co-educational institutions compared to all-female colleges, and that the women at women's colleges tended to be more successful than those at co-ed schools. In 2005 the National Center for Educational

Statistics (NCES) reported that bachelor's degree attainment for men has stagnated since the 1970s (approximately 61%), while women now graduate at greatly improved rates (61% in the 1970s vs. 71% in the 1990s).

While the causes and effects of women's increased enrollment and persistence remain debatable, the fact is that women now outnumber men on college campuses (United States Census Bureau, 2006) and women under the age of 45 outnumber men of the same age group as holders of bachelor's degrees (Justis, 2008), suggesting that gender plays at least some role in enrollment, retention, and persistence and should therefore be described by this study.

Race/Ethnicity

Similarly, Pascarella and Terenzini (2005) observed that African-American students tend to be more successful at Historically Black Colleges and Universities (HBCUs). Citing "considerable evidence" that minority students at predominantly White institutions feel isolated and dissatisfied, their overview of the research led them to conclude that the presence of a peer culture and a general orientation towards minority issues led to improved persistence.

Although it is not hard to find reports in both the scientific literature and the popular press bemoaning the poor attainment results of most minority students (Asian students appear to be the exception), a 2001 NCES report suggested that the gap, while still troubling, is not as great as feared, once prior educational achievement level is controlled (Jacobsen et al., 2001). As with gender, the literature always makes attempts to describe and control for differences in race/ethnicity when reporting on the effectiveness of academic programs that it must be included in this study.

Predicted Grade Point Index (PGI)

Academic performance is a strong predictor of retention, and grades tend to reflect both previous academic skills and intellectual capacity as well as current study habits and motivation (Pascarella & Ternezini, 2005). In fact, Pascarella and Terenzini wrote that grades may be the single best predictor of persistence, even when controlling for student background characteristics.

Campus residency

Resident students have numerous opportunities for engaging the institution academically and socially that simply do not exist for commuter students. Pascarella and Ternezini (2005) reported that retention of resident students is consistently better than that of commuter students. By definition a resident student has significantly more opportunities for interacting with other students of differing backgrounds, with faculty outside of the classroom, and with activities that he/she might not ordinarily experience. Recall that theories of student engagement require the student to be involved and integrated into the particular institution, and that the types of interactions that living on campus can make available and actively encourage are directly linked to theories of student psychosocial development and educational best practices.

Hours worked

Although working during college is associated with several beneficial outcomes, it is important to note that the content of the work, the location where the work is performed, and whether or not the work is related to the student's chosen career path do play a role (Furr & Elling, 2000). Astin (1993) noted that working off campus is negatively associated with degree completion and Pike, Kuh & Massa-McKinley (2008)

reported a statistically significant negative relationship between working more than 20 hours per week and grades, even after controlling for student characteristics and engagement. The authors also found that working 20 hours or less per week on campus was associated with positive student outcomes. Furr and Elling (2000) reported a significant relationship between hours worked and student participation in educationally purposeful activities. Pascarella and Terenzini (2005) found that increase in the number of hours worked had a negative impact on virtually all institutional markers for student success. Finally, students with high levels of unmet financial need will work more to pay for their education.

Overall, the critical break point for student employment is about 20 hours; anything more than that, particularly if it occurs off campus, is likely to have a negative association with student retention and persistence to degree (Pike, Kuh & Massa-McKinley, 2008; Dundes & Marx, 2006-2007). Therefore, this study had two categories for student employment, students who work less than 20 hours per week and students who work 20 hours or more per week.

Unmet need

The cost of attending college continues to rise faster than the general inflation rate (Ziegler, 2008), a trend that has been visible for nearly 30 years (Baum & Ma, 2009). Common sense dictates that as the total cost of attending college increases, when combined with decreases in educational grants and stagnating real wages, results in students borrowing and working more than previous generations. The pressure to "loan up" and work at or near full time to pay for college is both a testament to the enduring belief of economic advantage attached to a college education, and a challenge for

institutions desiring to engage students academically and socially. As noted previously, economics has entered the literature of retention in a way that earlier theorists did not fully anticipate, making unmet need an important variable for description and discussion in this study.

The National Survey of Student Engagement

While much research has focused on student demographics and institutional characteristics (and those variables were important to this study), research is now looking beyond them to student perceptions and student participation in educationally purposeful activities and tying those constructs to measurable outcomes like retention and persistence (Kuh et al., 2008). This line of inquiry is the reason why the National Survey of Student Engagement was selected to provide critical information for the study.

The National Survey of Student Engagement (NSSE) has been employed since 2000 on an annual basis as a means for colleges to determine to what extent its students are engaged in educationally purposeful behaviors. Student engagement has become an important construct for institutional assessment and planning (Kuh, 2009). Today, engagement is understood to mean much more than "time on task", and refers to the quality of effort and a student's involvement in productive activities that develop behaviors associated with life long learning (Kuh). NSSE provides institutions with a standardized form of actionable data that can be used to make improvements to the undergraduate experience and document good practice.

In the past decade, NSSE has been administered to more than one and a half million students. Students report on their level of engagement with good practices such as time spent studying, collaboration with faculty, and interaction with students of different

racial and ethnic backgrounds (Pascarella, Seifert, & Blaich, 2010). Engagement levels are said to be proxies for student learning outcomes (Kuh, 2009). The survey itself consists of 48 items organized around five constructs (Pascarella et al.):

1) Level of Academic Challenge (11 items). Class preparation, reading and writing required, institutional expectations for academic performance.
2) Active & Collaborative Learning (7 items). Class participation, collaborative work in and out of class, community based projects.
3) Student-Faculty Interaction (6 items). Interaction with faculty and advisors outside of the classroom, prompt feedback, working with faculty on research projects.
4) Enriching Educational Experiences (12 items). Interactions with people of different racial/ethnic backgrounds, opinions or values; participation in internships, study abroad, and co-curricular activities.
5) Supportive Campus Environment (6 items). How the institution helps students succeed academically and socially, supportive relationships among students, faculty, and staff.

These five benchmarks are indicative of students engaging in "educationally purposeful activities" which Kuh et al. (2008) concluded were positively related to student outcomes like grades and retention. An institution must offer programs that are complementary and allow the student to engage in these educationally purposeful behaviors. NSSE allows the institution to understand who its students are, how they spend their time, what they expect of the institution, and to plan and respond accordingly.

The NSSE benchmarks have more than a little in common with student development theory and practice, in particular Chickering and Gamson's "Seven Principles for Good Practice in Undergraduate Education". The seven principles, written in the mid 1980s, identify student-faculty contact, active learning, time on task, and high expectations as a research-based and common sense approach to developing strategies to improve teaching and learning (Chickering & Gamson, 1987). Similarly, it is possible to see institutional interventions as a form of person-environment interaction theories, in which interactions between students and their environment can be used to evaluate whether or not the intervention assist the student develop in a healthy way (Evans, Forney, & Guido-DeBrito, 1998). In the case of sequential institutional interventions which occur over time, the purpose must be to permit the student to gain experience and confidence, as external controls (like freshman programs designed to improve retention) fall away and the student is able to self-direct his behavior and to define his place in the world (Pascarella & Terenzini, 2005).

Interventions

The interventions selected for this study were not selected at random, but rather because they have a deep basis in the theoretical and empirical work. Notice that the three interventions occur across time, from pre-enrollment through the end of the first year. This reflects Tinto's theory that the student departure decision occurs over time, and includes three stages of psychological change. Failing to bridge the stages will result in a decision to leave the institution. Therefore, the extended orientation program helps the student bridge the separation phase, freshman seminar bridges the transition stage, and the learning community bridges the incorporation phase. Likewise, SOAR helps focus the

student's initial commitment from attending college in general to attending the institution in particular, while freshman seminar and learning communities are designed to increase the student's subsequent commitment to the institution and graduation through increased academic and social engagement. The interventions (and indeed, the entire institutional effort at retention and persistence) provide a continuum of activities along which a student can both connect with the institution and improve his or her own learning outcomes.

Extended Summer Orientation Programs

At the institution to be studied, Student Orientation, Advising and Registration (SOAR) is a program designed to provide new students with a comprehensive and coordinated introduction to the university. SOAR helps prepare students for success in the first semester through confidence building activities and learning how to navigate the bureaucracy. Activities at SOAR include academic placement testing, social ice breakers, communal meals, and college-specific advising and registration. The program runs one and one-half days, and parents are invited to attend concurrent sessions. Academic advising is required for all entering freshmen, and the student is unable to register for classes until the advisor meeting takes place and the advisor removes "holds" on the student's account. Students must attend the entire SOAR program, as registration is the final thing students do before going home. The program runs multiple times in June and July; a session at the end of August is truncated and students who attend the August session generally exhibit characteristics that are associated with poor retention (T. W. Elling, personal communication, June 5, 2009). Only students who attended the June and July sessions were studied.

SOAR is a type of summer "bridge" program, which Strayhorn (2009) noted may be the oldest strategy to increase retention. Chasteen (2005) found that a comprehensive orientation was positively associated with retention, hours attempted and completed, but had no effect on first semester GPA. Lehning (2008) found that an orientation participant was statistically significantly more likely to be retained but that only a small part of the variance could be directly attributed to the extended orientation program at Kansas State. Similarly, Moore (2004) found that voluntary attendance at a summer orientation program for developmental students was associated with decreased rates of academic probation, while Singer (2003) found that while orientation programs may be effective, the amount of information communicated may be overwhelming. The subject has been studied for a long time; twenty years ago, Rice and Thomas (1989) found that the more intensive the orientation experience, the more students tended to interact with faculty and earn higher grade point averages. Interestingly, their research found that those same students tended to be more dissatisfied with the quality of the interactions and were more critical of the institution.

Freshman Seminar

Freshman seminar is probably the most researched of the three interventions used in this study and is generally believed to be effective at improving student retention (Pascarella & Terenzini, 2005). Ideally, a freshman seminar should be concerned with both the needs of the students and the expectations of the institution to help transition the student through academic and social development (Hunter & Linder, 2005). At the institution under study, the freshman seminar program is offered by academic affairs, and is strongly encouraged for students who have an undeclared major upon entry. Students

enrolled in major fields of study may elect to take freshman seminar or get the elements of it in other college-specific programming, including (but not limited to) college-based learning communities.

The emergence of the modern freshman seminar is attributed to work done at the University of South Carolina (USC) in the 1970s, and researchers (notably John Gardner, a pioneer in this field and now Executive Director of the Policy Center on the First Year of College) working at USC identified several characteristics of successful freshman seminars that included the awarding academic credit, a mix of academic and social content, and collaboration between academic affairs and student affairs professionals (Barefoot & Fidler, 1996). Starke (1994) concluded that efforts at improving retention through freshman seminar programming were successful, with students having higher GPAs and more positive attitudes towards faculty, a finding replicated in 2007 by Babbitt, who reported greater student confidence towards the entire college experience.

Noble, Flynn, Lee, and Hilton (2008) acknowledged the mixed results of retention research, but reported that among nearly 3000 resident freshman seminar participants studied first year GPAs are higher than either non-resident or non-freshman seminar students, supporting Fidler and Moore's 1996 report that living on campus provides a statistically significant improvement on persistence. Resident students who take a freshman seminar course are less likely to drop out, and interestingly, they noted that not all the variance is accounted for by either factor, suggesting that there may indeed be a compounding effect. Lang (2007) found that while freshman seminar did not appear to have an impact on GPA, students taking the seminar returned at a higher rate (88.3% vs. 80.6%) than those who did not, while Janz (2004) found that freshman seminar was not a

significant predictor of retention at the University of Wisconsin. Meanwhile, Strayhorn (2009) wrote that freshman seminar has conditional positive effects on academic satisfaction, an encouraging piece of information for this study as it prepared to look at engagement.

Learning Communities

The academic services office offers learning communities as a research-based method of increasing student academic engagement through small and supportive learning and living arrangements. The one-year learning communities are generally designed for residential students, although the institution offers a commuter learning community and some learning communities may not have a residency requirement. Learning communities are offered by institutions as a means for achieving a small college experience in a large university setting (University of North Carolina at Charlotte, 2009), and were noted by Laufgraben (2005) to have a positive impact on retention.

Learning communities attempt to connect the students both academically and socially to the institution, emphasizing non-classroom contact between faculty and students. Johnson (2001) reported positive effects for retention in both underprepared and above-average students in learning communities, and Gerkin (2009) revealed that learning community students transition well to collegiate life and have higher levels of persistence. Gerkin's study is notable also because the institution studied uses a Tinto-Astin hybrid model for retention. Similarly, Zientek (2008) wrote that, after controlling for pre-college characteristics, participation in a learning community had a significant impact on both GPA and academic standing, which are precursors to retention (just as retention is a precursor to persistence). Learning communities also improve social

engagement, as Eck, Edge, and Stephenson (2007) showed at Rollins College. Rollins learning community students had greater knowledge of personal wellness, ability to see multiple sides of issues, and evaluate the quality of facts and opinions (critical thinking).

Multiple Effects of Interventions

In a 2006 issue of the Journal of College Student Retention, Keup studied the relationship between three curricular-based retention interventions (freshman seminar, learning communities, and service-learning) and first-to-second year retention. Drawing upon Tinto's work as a foundation, Keup used national survey data obtained from the Cooperative Institutional Research Program (CIRP) at the Higher Education Research Institute at the University of California, Los Angeles, employing the 2002 CIRP Freshman Survey and the 2003 Your First College Year survey. One hundred and fifteen institutions administered both surveys, providing Keup with a sample of nearly 20,000 students, with "representation from every control, type, and selectivity of colleges" (p. 67). The researcher then analyzed the association between participation in the interventions and retention as well as the relationship between the students in the interventions and the social and academic systems of the institutions. While the study was limited by its use of student self-reported intent to re-enroll (rather than actual re-enrollment), the study provided useful identifiers of academic and social engagement, which Keup used to measure "potentially mediating effects" (p. 70) of engagement on the decision to re-enroll.

The study found that all three interventions had positive effects on good academic practices and total hours of social interaction with friends. Keup wrote that the three programs "may facilitate specific institutional experiences that lead to the decision to

persist rather than serve as a direct conduit to retention" (p. 73) and that "the combination of these two interventions (freshman seminar and learning community) results in one of the largest positive coefficients in the entire analysis" (p. 78).

Summary

First year retention is important to study because the majority of student departure occurs during the first year. Evaluation of theory is important for institutions to develop and operate strategies and programs designed to increase student retention (Lang, 2007). Tinto (2000) articulated five conditions for student success in college, which included the setting of clear and high expectations, institutional support for students transitioning to collegiate life, feedback, involvement, and relevancy in the curriculum. The institution must create communities that engage students with other members of the college, particularly other college students. The interventions studied addressed those conditions in a variety of ways. Miller, Janz, and Chen (2007) noted Tinto claimed only a small percentage of dropout is due to academic failure and that all students benefit from freshman seminar, regardless of pre-college attributes; by analyzing programs that are designed to more broadly connect the student with the institution, the current study expanded beyond the linear connection of high school academic success leading to college academic success leading to college persistence.

When analyzed in isolation, research points to small impacts of the different interventions to improve retention. What remained to be seen, and what has been raised but not answered in the literature, is whether or not these efforts combine to make a whole greater than the sum of the parts. Keup's (2006) work indicated that it is possible to analyze the interventions for both individual and overall efficacy and to link

participation in those programs to the key theoretical constructs of academic and social integration and measure them against retention. Chapter Three will discuss how the proposed study will attempt to apply that analysis for a large, public institution in the southeast.

CHAPTER 3: METHOD

The purpose of this study was to determine if a series of institutional interventions increase levels of student engagement and first-to-second year retention. The study also investigated if there was a positive relationship between engagement and retention, as predicted by Tinto's theory of student departure. The interventions studied were selected to parallel the psychological stages of Tinto's student departure theory. In this chapter, the researcher will present the research hypotheses to be tested, followed by a description of the population to be studied, procedures used to collect data, an explanation of the dependent and independent variables, and the statistical analyses used to evaluate the data.

The review of the literature demonstrated that while the effectiveness of individual interventions in improving retention has been substantiated, additional research is needed to determine if there is a compound effect from student participation in more than one intervention. Keup (2006) suggested that such research is necessary and provided a framework for studying the combined effects of retention interventions. Therefore the research questions are as follows:

1) Are student characteristics such as gender, race, high school grade point average, commuter status, and hours worked per week predictive of engagement and first-to-second year retention?

2) Is there a relationship between participating in the selected institutional interventions and levels of student engagement?
3) Is there a relationship between participating in the selected institutional interventions and first-to-second year retention?
4) To what extent does participation in more than one of the selected institutional interventions affect engagement and retention?
5) Is there a relationship between level of engagement and retention?

Hypotheses

The study built upon the existing literature and research and was guided by the need to determine the efficacy of the selected institutional interventions to increase student engagement and retention.

Student Engagement

$H_0$1: There is no difference in the level of engagement for students across the selected characteristics (R1).

$H_0$2: There is no difference in the level of engagement in students who participate in one intervention when compared to those who participate in zero interventions (R2).

$H_0$3: There is no difference in the level of engagement in students who participate in more than one intervention when compared with students who participate in one intervention (R4).

Retention Rate

$H_0$4: There is no difference in the retention rate for students across the selected characteristics (R1).

$H_0$5: There is no difference in the retention rate for students who participate in one intervention when compared to those who participate in zero interventions (R3).

$H_0$6: There is no difference in the retention rate for students who participate in more than one intervention when compared to students who participate in one intervention (R4).

$H_0$7: There is no association between the level of engagement and retention (R5).

Participants

The population studied was the freshman class of 2008 at a large, urban, public research university in the southeast. The institution reported a first-year retention rate of 78% for its 2007 class (National Center for Educational Statistics [NCES], 2009a). The 2008 group consisted of 3,090 first-time, full-time students, and per U.S. Department of Education standards, only those students met the criteria for reporting in retention figures. The research was conducted under the supervision of the Office of Student Affairs Research, which provided access to the appropriate data and ensured student confidentiality.

The freshman class of September 2008 included 3,090 new students. Females comprised 52.7% (n=1629) of the population, and more than four-fifths (81.3%) of the population was 18 years old; in fact, 98.3% of the group was between 17 and 19 years old, the traditional age for college freshmen. This aligned the population nicely with previous research, which also focused largely on traditional-aged students. White students comprised 73.4% of the population, while African-Americans made up the largest minority group at 15.1% (n = 2269 and 467, respectively). By way of comparison, the National Center for Education Statistics reported that in 2006 Whites made up 69.6%

and African-Americans 9.9% of the total college enrollment. White students have hovered right near 70% for the three year period 2004-2006, while African-American students have declined as a percentage of the population as Hispanic students have increasingly enrolled in college (NCES, 2009b). The Predicted Grade Point Index (PGI), an institutional tool using previous school performance to predict future college academic performance, had a population mean GPA of 2.66 (*SD* = 0.38), suggesting an incoming class of average academic ability.

Although Tinto's early theoretical work did not touch upon economic factors in retention, the amount of money students borrow to finance their education has increased greatly in the past twenty five years. Economic stress affects retention and this is reflected both in Tinto's more recent work and in empirical research (Pascarella & Terenzini, 2005). For that reason, economics is an important consideration for retention research (St. John, Cabrera, Nora, and Asker [2000]), and will thus be described for the population to be studied. The average amount of unmet need for the study participants was $3449 (*n* = 874), but the high standard deviation (*SD* = 3808) indicates that the median amount of $2330 might be a better indicator of the relative need of the group.

In 2007, nearly half of the students at the institution borrowed money from non-governmental sources with an average loan amount of $4086 (NCES, 2009). This indicates that despite the relatively low cost of tuition, the students rely heavily on aid and borrowing to finance their education. This economic need is likely to be reflected in the number of hours students report working to support themselves. The number of hours a student works impacts his/her ability to engage in the academic and social structures of the institution (Furr & Elling, 2000; Pike et al., 2008) Extending Astin's theory, greater

economic need translates into more hours worked, less time engaged in other collegiate activities (like studying or participating in extra-curricular activities), resulting in reduced retention. This is why both unmet financial need and number of hours worked were characteristics for analysis in this study.

As a reference point, the institution to be studied looks somewhat different than the state flagship campus. The flagship is about one-third larger in its freshman class size, has a much higher proportion of females (who typically graduate at higher rates than men), and much lower rates of borrowing ("affordability" being an issue which can greatly affect retention and persistence). Thus, the significantly higher graduation rate at the flagship can at least be partially explained by the theoretical construct that what a student brings with them to college is important to what they will attain once there.

Procedure

The dependent variable, first-year retention, is the outcome with which the institution is most concerned. This statistic must be reported to the Department of Education for publication and comparison against other institutions as a measure of institutional effectiveness. This number is obtained by using methods established by the United States Department of Education for reporting educational statistics. Retention and engagement will be compared against the two independent variable groups, student characteristics and intervention participation. Recall that retention research has traditionally been used for predictive purposes (hence the use of student characteristics) and assessment of institutional programming (hence the use of the different interventions).

It is important to note that the participation rate in the interventions is very high, with only 205 students participating in zero interventions and the vast majority of the students participating in more than one. While this speaks well to the comprehensiveness of the retention efforts at the institution, it may reduce the statistical power of the comparisons to single interventions. However, the literature has already established the general efficacy of the interventions when analyzed in isolation. The purpose here is to see if the combinations yield more robust retention than might ordinarily be expected.

Independent Variables

The first group of independent variables addresses student characteristics which research has shown to have an association with retention. As Kuh et al. (2008) summarized, who a student is when he gets to college is associated with what he does once in college, even if the effect is small. These include PGI (past academic performance being a relatively good predictor if future academic performance); gender (females persist at higher rates than males); race (White students persist at higher rates than minority students); unmet need (students with greater economic stress are more likely to depart before graduation); hours worked (students who work 20 or more hours per week tend to retain at lower rates); and on-campus residency status (resident students typically retain at higher levels than commuters).

Of these six variables, gender and residential status are dichotomous, while race and hours worked are categorical. Hours worked responses varied from zero to more than 40 hours per week. Previous studies identified that working 20 or more hours per week was an important break point for retention. Chen, Gonyea, Sarraf, Brcka-Lorenz, Korkmaz, Lambert, Shoup, & Williams (2009) suggested that collapsing responses into a

few categories is helpful when running analyses to predict which types of students will participate in various activities. Therefore, it was appropriate to categorize student responses to the number of hours worked into three groups: Did not work, worked less than 20 hours per week, and worked 20 or more hours per week. Unmet need and PGI are continuous scale variables were treated differently.

According to the theoretical model, these characteristics impact the student's initial commitment to attending college in general *and* the college chosen in particular. Once enrolled, the student must engage both academically and socially with the institution. Engagement is what allows the student to succeed both within the explicit rules of the school and also develop an affiliation with the school, or what might be commonly called "fit". Therefore, this information was important to this study as a way of determining if certain student characteristics predict participation in interventions (a proxy for determining initial commitment to attending college) and if those factors predict subsequent engagement with the institution (demonstrated through item analysis on NSSE), and are ultimately predictive of retention.

The second group of independent variables, institutional interventions, was the ones of greater interest to the study, since they have already been shown to be individually effective. The purpose of the study was to determine if participation in more than one of the interventions, because they parallel the psychological stages of the theory, would compound the gains in engagement and retention because the student will make a more permanent commitment to college in general and, more important, to the institution in particular. Following the theory to its logical conclusion, these increases in engagement should yield increases in retention.

Engagement and NSSE

Levels of student engagement were determined from student responses to the National Survey of Student Engagement (NSSE). The survey is administered at the institution under study every other year. Questions on the NSSE are designed to identify important components of the student experience, including level of academic challenge, active and collaborative learning, student-faculty interactions, enriching experiences, and a supportive campus environment (NSSE, n.d.). Items on the survey are designed to collect information regarding educational best practices, particularly those identified in the work of Chickering and Gamson that lead to desirable student outcomes, including retention and persistence (NSSE, 2009a). The survey has been repeatedly analyzed for its psychometric properties, and both its validity and reliability have been found to be very good (Kuh, 2004). The survey has been subject to validity testing, including predictive validity for retention through logistic regression from a sample of approximately 4000 survey respondents (NSSE, 2009b). While NSSE cannot strongly relate every item to the retention outcome, positive relationships are demonstrated between the benchmark constructs and retention (NSSE, 2009b). Cronbach's alpha testing for internal reliability on the benchmark components (academic challenge, etc.) range from 0.618 – 0.789 (NSSE, 2009c). The survey results are reported back to the institution with mean scores for each item and comparison scores for similar Carnegie classification schools and overall national scores, with markers for differences that achieve statistical significance.

Gordon, Ludlum, & Hoey (2008), researching the external validity of NSSE, found that 15 items on the survey were significantly associated with positive student outcomes such as grades and retention. The study used 14 of the items to demonstrate

level of student engagement for purposes of this study. The item not utilized asked about practicum, internship, and clinical experiences and was out of place with the remaining items. The items are presented at Table 2.

Table 2

NSSE Items Associated with Academic Success and Retention

NSSE Item	Language
1.f.	Came to class unprepared.
1.j.	Tutored another student (paid or unpaid).
1.o.	Talked about career plans with a faculty member or advisor.
1.t.	Discussed ideas with faculty outside of class.
4.a.	Homework problem sets taking more than 1 hour.
5.	Level of challenge on examinations.
6.b.	Exercised or participated in physical fitness activity.
8.a.	Quality of relationships with other students.
8.b.	Quality of relationships with faculty.
9.a.	Hours per week spent preparing for class.
10.b.	Institutional academic support.
10.e.	Institutional social support.
10.f.	Institutional emphasis on attending events and activities.
11.b.	Institution contributes to acquiring job/work related knowledge or skills.

The survey uses several instrumentation scales for responses. The first group of questions measure "academic and intellectual experiences". These items (1.f., 1.j., 1.o., and1.t.) use a four point scale where a value of one equals "never", a value of two equals "sometimes", a value of three equals "often" and a value of four equals "very often". This scale is also used for additional collegiate experiences, item 6.b.

The number of "problem sets which take more than one hour" a student does in a week, covered in item 4.a., uses a five-point scale where one equals "none", two equals "1-2", three equals "3-4", four equals "5-6", and five equals "more than 6". "Examinations" (item 5) uses a seven-point scale, with one assigned "very little" through seven, which is assigned "very much". Items 8.a. and 8.b., "quality of relationships" also use a seven-point scale from "unfriendly, unsupportive" (value = 1) "friendly, supportive" (value = 7).

"Time spent preparing for class" item 9.a. offers the respondent eight choices, in four hour increments, starting with "zero" (value = 1) and ending with "more than 30" (value = 8). Finally, items 10.b., 10.e., 10.f. ("institutional environment") and 11.b. ("educational and personal growth") return to the four point scale, with slightly different descriptors, where one is "very little", two is "some", three is "quite a bit", and four is "very much".

Data Collection and Analysis

The researcher received approval from the Institutional Review Board in the spring of 2010 to conduct the study, and a data request was submitted to the appropriate official in the Office of Student Affairs Research, which analyzes information, including responses to NSSE, of this type. A de-identified data set was provided in April of 2010 in

a MYSTAT file. MYSTAT is a student version of the SYSTAT 12 statistical analysis software with a graphical user interface similar to that of SPSS. In fact, SYSTAT files may be saved as SPSS files with no loss of data, allowing the researcher to use both software packages.

A descriptive analysis identified relationships between student characteristics and participation in interventions and first-to-second year retention. Cross-tabulations were conducted to examine the relationship between participation in the interventions and retention (*cf* Keup, 2006). Gravetter and Wallnau (2007) wrote that nonparametric tests such as the chi-square are appropriate when there are dichotomous variables and no assumption is made about the population distribution. Therefore, chi-square tests for goodness of fit were used for hypothesis testing where appropriate. A principal component analysis was run on the selected NSSE items to simplify the number of variables and group related items together. While Chen, et al. (2009) recommended changing NSSE item responses to workable scales, enabling the use of *t*-tests to analyze between-group differences, this study left the values as reported by NSSE, enabling simpler comparisons with national results and similar institutions, by item. Chen, et al. also recommend Cohen's *d* for testing effect size and analysis of variance for testing interaction effects. An alpha level of .05 was chosen for all statistical tests.

Summary

Keup (2006) suggested that comparisons between participation in one program and none overlooked the possibility that participation in more than one intervention may lead to a different effect on retention. She recommended multivariate analysis to explore if the effects of the interventions on retention might be dependent upon participating in

more than one program. Her findings indicated that while certain combinations were only marginally statistically significant, an analysis of the odds ratio showed that the combination of freshman seminar and learning community produced a person 52% more likely to show intent to re-enroll (recall that Keup's study did not look at retention, but rather intent to re-enroll). This study used these analytical paths:

1) Do student entry characteristics predict participation in institutional interventions, subsequent engagement, and retention?
2) Does participation in more than one intervention predict an increase engagement and retention more than could be explained by chance, regardless of student entry characteristics?
3) Do increased engagement levels as shown by participation in NSSE correlate with increased retention?

The results of the study will be presented in Chapter Four.

CHAPTER FOUR: RESULTS

This study used data provided by the Office of Student Affairs Research at a large, public institution in the southeastern United States to examine the effects of institutional interventions on student engagement and first year retention. The study analyzed whether or not participation in more than one institutional intervention yielded increases in engagement, as measured by the National Survey of Student Engagement (NSSE), and retention over those student who participated in one or zero interventions. Theory holds that students who participate in institutional interventions will increase levels of engagement which in turn should yield increases in retention. The study tested if that was measurably true. The study utilized descriptive statistics, chi-squares, *t*-tests, analysis of variance, and multivariate analysis of variance to examine the research questions.

The participants in the study consisted of the 3090 first-time, full-time freshman students who made up the incoming class of 2008. The student body was more female than male, with roughly a 53/47 ratio, predominantly White (74%) with African-Americans making up the largest minority (15%) in the population, and primarily residential, with three-quarters of the students living on campus. Other factors in the literature relating to retention that were measured included academic ability (Projected Grade Point Index of 2.66), number of hours worked per week (less than 2% worked

more than 20 hours per week), and a median unmet need (the amount of tuition and fees not covered by financial aid) of $2330.

. Table 3 presents the composition of the student population on the student demographic variables described above, along with the frequencies for responding to the NSSE survey and first year retention.

Table 3

Student Characteristics *(N=3090)*

Variable	N	%	Took NSSE	Retained
Gender Male	1461	47.3	156	1143
Gender Female	1629	52.7	301	1254
Race Caucasian	2269	73.4	338	1732
Race African-Amer.	467	15.1	72	378
Race Hispanic	117	3.8	14	94
Reside On Campus	2322	75.1	360	1820
Reside Off Campus	768	24.9	97	577
Do Not Work*	496	16.1	155	416
Worked <20 Hours*	159	5.1	40	132
Worked ≥20 Hours*	60	1.9	16	47

*Self-reported

Validity and Reliability of Chosen NSSE Items

Prior to analyzing the potential association between engagement and retention, a principal component analysis was performed on the survey items suggested by the literature review as being associated with retention. This analysis allowed the researcher to detect the underlying structure of these 14 items, reduce the number of variables to be tested, and confirm their relationship within certain constructs. Recall that NSSE itself is tested for internal reliability using Cronbach's alpha values for five benchmark constructs. The 2008 freshman survey instrument has a variety of Cronbach's alpha scores, ranging from a high of .79 for "campus supportive environment" to a low of .62

for “enriching educational experience” (NSSE, 2010a). Because the current study utilized certain items from within NSSE which previous work had associated with retention, a factor analysis was needed to see if groupings of items would occur. NSSE items have differing value scales, so the first step was to convert all individual response values to *z*-scores.

From a statistical point of view, the principal component test identifies factors that account for smaller and smaller amounts of variance from a hypothetical regression line drawn on a scatterplot of the variable scores (StatSoft, n.d.). This variance is expressed as “Eigenvalue”, and can be visually represented on a scree plot. The line indicates where the Eigenvalues (Y axis) level off by number of factors (X axis). The scree plot showed a sharp decrease from the first factor to the second, and then a flattening of the line outward for the remaining factors, suggesting that two factors were being tested by the items. The researcher then eliminated item 1.f. from the analysis because it is a negative question; that is, while all other response scores for the NSSE items are higher for positive behaviors, item 1.f. assigns higher scores for *negative* behaviors (i.e., the more one comes to class unprepared, the higher the score). In the ensuing analysis, 38.7% of the variance between the 13 variables was explained by the two factors. Items 4.a. and 9.a. were associated with one factor, which is described as “time management”, nine items were associated with a second factor which is described as “interaction quality”, while two items (1.j. and 5) fit neither descriptor very well. These two items were removed from the analysis, leaving a total of 11 items for study.

If engagement can be thought of as the result of the amount and quality of interactions a student has with the institution and the individuals within that institution,

then the items selected were certainly related. The two items linked to time management were self-evident: items asking students to estimate the number of problem sets it took more than one hour to complete (item 4.a.) and the amount of time spent preparing for class through reading, writing, studying, and doing lab work (item 9.a.). Interaction quality items were as follows:

- Talked about career plans with a faculty member or advisor (item 1.o.)
- Discussed ideas from readings or class outside of class (item 1.t.)
- Exercised or participated in physical fitness (item 6.b.)
- Quality of relationships with faculty and other students (items 8.a. & 8.b.)
- Institutional support for academic success (item 10.b.)
- Institutional support for social success (item 10.e.)
- Attendance at campus events, athletics, and cultural activities (item 10.f.)
- Acquisition of job/work related skills or knowledge (item 11.b.)

As part of its own psychometric testing, NSSE reports on intercorrelations of items within each of its benchmark constructs. In the current study, four of the nine items selected for interaction quality were part of the NSSE "supportive campus environment" construct, so the inclusion of those four items makes sense. Their relationship is supported by a Cronbach's alpha of .79 for the construct and correlations ranging from a low of .26 (Relationships with other students *X* Academic support) to a high of .47 (Institutional support for social success *X* Institutional support for academic success*)* (NSSE, 2010b). The other intercorrelations NSSE reported that are germane to the current study are .43 (Relationships with other students *X* Relationships with faculty members) and .42 (Institutional academic support *X* Attendance at campus events). In

sum, the instrument and its component items are well tested for reliability, and are suitable for a new analysis.

It is reasonable to assume that students who score highly on these selected items would fit the description of an engaged student, one who values the interactions he or she has with the institution and with other people at the institution. While the overall Cronbach's alpha level (.71) of the NSSE survey was less than ideal, it certainly is within McMillan & Schumacher's (2001) oft-cited acceptable range of .70 - .90. The researcher concluded that the items selected to serve as proxies for student engagement were acceptable for purposes of this study. In the following tables, the items are grouped by the two constructs revealed by the analysis- time management and interaction quality.

Research Questions and Hypotheses Relating to Engagement

The research questions relating to student engagement and institutional intervention were as follows:

1. Are student characteristics such as gender, race, predicted grade point index, commuter status, unmet need, and hours worked per week predictive of engagement?
2. Is there a relationship between participating in the selected institutional interventions and levels of student engagement?
3. To what extent does participation in more than one of the selected institutional interventions affect engagement?

An alpha level of .05 was used for all statistical tests.

Engagement Question 1: Predictive Value of Student Characteristics

Engagement question one resulted in a null hypothesis stating that there is no difference in the level of engagement for students across the selected characteristics.

The objective for the first set of tests within this hypothesis was to determine if the respondents to NSSE differed in composition from the general population and utilized the chi-square for goodness of fit. This test is appropriate for examining whether or not observed proportions in a sample correspond to the expected proportions from the population (Gravetter & Wallnau, 2007). Testing demonstrated that there were significant differences in the proportion of respondents to the NSSE survey by gender and number of hours worked, but no significant differences by either race or residence location:

Gender: χ^2 (1, n = 476) = 28.35, p <.05

Hours worked: χ^2 (1, n = 202) = 57.89, p <.05

Race: χ^2 (2, n = 464) = 1.04, p > .05

Residence: χ^2 (1, n = 476) = 3.44, p > .05

These tests revealed that female students were significantly more likely to respond to the NSSE survey than male students, and that students working fewer than 20 hours per week responded somewhat less than might have been expected, while the observed frequencies of response for race and on- or off-campus residence were not.

Because the population standard deviation was known, a z-test was used to examine if there were significant differences in Projected Grade Point Index (PGI) between the NSSE respondents and the general student population. In this case, the NSSE respondents had a statistically significant higher PGI of 2.73 (SD = 0.41) against the population mean of 2.66 (SD = 0.38), where z = 4.05, p < .05. The null hypothesis in this

case is rejected. Although the respondent PGI values were not normally distributed, the assumption of normal distribution may be violated without negatively affecting the validity of the test if the sample is large (Gravetter & Wallnau, 2007).

As noted earlier, the average of unmet need was a problematic figure, given that the standard deviation for the population was essentially the same size as the mean. For unmet need, a median comparison was recommended (C. Wang, personal communication, July 13, 2010). In this case, the median unmet need for NSSE respondents was $2293 as compared to the general student population unmet need median of $2330. A difference of just $37 in the context of thousands of dollars in college tuition and fees would not likely play a significant role in the level of engagement or a decision to depart the institution, and thus the hypothesis fails to be rejected.

Within Group Differences

Although the frequency analysis provided a general assessment of the predictive value of the student characteristics and retention, further analysis within the characteristic groups provides greater insight. Tables 4 through 7 detail the mean scores for gender, race, residence, and work against the 11 NSSE items shown to correlate to time management and interaction quality.

Gender.

Table 4 shows that female students were significantly more likely to report that the institutional environment supported them academically $t(463) = 1.92$, $p = .03$, although the effect size was small. The only other two items that approached statistical significance were that females tended to attend more events on campus and were more likely to talk about career plans with a faculty member or advisor.

Table 4

NSSE Mean Scores by Gender

Item	Gender	*N*	*M*	*SD*	*t*	*p*	*d*
Time Management							
4.a.	Male	167	2.67	1.04			
	Female	307	2.49	1.06	-1.77	.96	0.17
9.a.	Male	164	3.90	1.58			
	Female	305	3.83	1.42	-0.49	.69	0.75
Interaction Quality							
1.o.	Male	169	2.08	0.87			
	Female	316	2.21	0.87	1.49	.07	-0.15
1.t.	Male	170	2.54	0.86			
	Female	315	2.63	0.85	1.08	.14	0.11
6.b.	Male	167	2.81	1.00			
	Female	310	2.64	1.00	-1.74	.96	0.17
8.a.	Male	166	5.36	1.36			
	Female	305	5.23	1.39	-0.97	.83	0.95
8.b.	Male	166	4.95	1.21			
	Female	304	4.86	1.34	-0.67	.75	0.07
10.b.	Male	162	2.99	0.72			
	Female	303	3.14	0.78	1.92	.03	-0.20
10.e.	Male	162	2.60	0.95			
	Female	302	2.60	0.88	-0.03	.51	0.00
10.f.	Male	162	2.77	0.96			
	Female	301	2.89	0.90	1.39	.08	-0.13
11.b.	Male	156	2.85	0.84			
	Female	301	2.64	0.90	-2.36	.99	0.24

Race.

With more than two groups to compare mean scores, an analysis of variance (ANOVA) was the appropriate test. Prior to applying the ANOVA, Levene's test of homogeneity of variances for all items was run. None of the items in either the "time management" or the "interaction quality" group achieved statistical significance, therefore the assumption of equality of variances hypothesis is supported, permitting the ANOVA to proceed.

When comparing the three racial groups, the ANOVA test revealed a significant difference between the mean scores for only two items, attendance at campus events, $F(4, 397) = 2.35$, $p = .05$, $\acute{\eta}^2 = 0.02$ and number of problem sets taking more than one hour to complete, $F(4, 404) = 2.39$, $p = .05$, $\acute{\eta}^2 = 0.02$. Post-hoc testing found that the mean scores for African Americans were not significantly different from scores for White or Hispanic students.

Residence.

When analyzing engagement by place of residence, students living on campus were significantly more likely to have exercised, $t(475) = 4.61$, $p < .05$; felt they had acquired job related skills, $t(455) = 1.95$, $p < .05$; and that the quality of their relationships with other students was more friendly and supportive, $t(455) = 2.83$, $p < .05$. Place of residence appears to have had only a small effect on the variance surrounding job skill acquisition, and a moderate effect on exercise and inter-student relationships. Detailed data is provided at Table 6.

Table 5

NSSE Mean Scores by Race

Item	Race	*N*	*M*	*SD*	*F*	*p*	*ή²*
Time Management							
4.a.	White	353	2.48	1.02			
	Afr.-Am.	72	2.69	1.18	2.39	.05	0.02
	Hispanic	15	2.80	0.94			
9.a.	White	347	3.87	1.50			
	Afr.-Am.	74	3.72	1.47	.44	0.78	<0.01
	Hispanic	14	3.64	0.93			
Interaction Quality							
1.o.	White	362	2.16	0.89			
	Afr.-Am.	75	2.25	0.86	0.29	.89	<0.01
	Hispanic	15	2.20	0.86			
1.t.	White	360	2.62	0.83			
	Afr.-Am.	75	2.52	0.95	0.88	.48	<0.01
	Hispanic	15	2.80	0.78			
6.b.	White	354	2.73	1.03			
	Afr.-Am.	75	2.71	0.97	1.84	.12	0.02
	Hispanic	14	2.93	1.14			
8.a.	White	348	5.34	1.35			
	Afr.-Am.	75	5.15	1.51	1.37	.24	0.01
	Hispanic	14	5.64	1.28			
8.b.	White	348	4.90	1.28			
	Afr.-Am.	74	4.85	1.47	1.36	.25	0.01
	Hispanic	14	5.29	1.38			
10.b.	White	346	3.07	0.77			
	Afr.-Am.	71	3.20	0.75	1.18	.32	0.01
	Hispanic	14	3.21	0.70			
10.e.	White	345	2.59	0.91			
	Afr.-Am.	71	2.75	0.91	0.90	.46	<0.01
	Hispanic	14	2.50	0.94			
10.f.	White	346	2.82	0.93			
	Afr.-Am.	71	3.09	0.86	2.35	.05	0.02
	Hispanic	14	2.86	0.95			
11.b.	White	338	2.74	0.87			
	Afr.-Am.	72	2.64	1.01	0.74	.57	<0.01
	Hispanic	14	2.57	0.76			

Table 6

NSSE Mean Scores by Residence

Item	Residence	*N*	*M*	*SD*	*t*	*p*	*d*
Time Management							
4.a.	On Campus	376	2.57	1.07			
	Off Campus	98	2.45	0.98	-1.05	.29	0.12
9.a.	On Campus	369	3.84	1.48			
	Off Campus	100	3.89	1.48	0.30	.77	-0.03
Interaction Quality							
1.o.	On Campus	383	2.16	0.88			
	Off Campus	102	2.16	0.83	-0.08	.94	0
1.t.	On Campus	382	2.59	0.84			
	Off Campus	103	2.63	0.92	0.44	.66	-0.05
6.b.	On Campus	375	2.81	0.97			
	Off Campus	102	2.30	1.00	-4.61	<.01	0.52
8.a.	On Campus	370	5.37	1.33			
	Off Campus	101	4.93	1.51	-2.83	<.01	0.31
8.b.	On Campus	370	4.94	1.26			
	Off Campus	100	4.73	1.42	-1.41	.16	0.16
10.b.	On Campus	365	3.08	0.76			
	Off Campus	100	3.10	0.79	0.21	.84	-0.03
10.e.	On Campus	365	2.62	0.88			
	Off Campus	99	2.51	0.96	-1.15	.25	0.12
10.f.	On Campus	364	2.88	0.87			
	Off Campus	99	2.73	1.05	-1.45	.15	0.16
11.b.	On Campus	360	2.75	0.89			
	Off Campus	97	2.56	0.87	-1.95	.05	0.22

Hours worked.

Table 7 shows that when considering the number of hours worked, students who worked less than 20 hours per week were more likely to report they were acquiring job skills, $t(190) = 2.82$, $p = .003$ with a very high effect size figure; that the institution supports them academically, $t(195) = 1.97$, $p = .03$; that their relationships with faculty were of higher quality, $t(199) = 2.55$, $p = .006$; and that the quality of their relationships with other students was higher, $t(198) = 1.76$, $p = .04$. In these three items, the number of hours worked plays a moderate to important role in explaining the variance between the two groups.

In summary, the results of the tests of the relationship between student characteristics and engagement were mixed. While gender and the number of hours worked seemed to have some effect on levels of engagement, race and residence did not. The PGI scores for engaged students was higher than that of the general student population, while the financial need of students did not substantially differ between the two groups. Analysis within the groups revealed some significant differences in individual item responses.

Table 7

NSSE Mean Scores by Hours Worked

Item	Hours	*N*	*M*	*SD*	*t*	*p*	*d*
Time Management							
4.a.	<20	195	2.54	1.06			
	≥20	6	2.17	0.75	0.85	.20	0.40
9.a.	<20	193	3.96	1.46			
	≥20	6	3.83	1.47	0.22	.42	0.09
Interaction Quality							
1.o.	<20	198	2.14	0.82			
	≥20	7	2.14	0.90	-0.005	.50	0
1.t.	<20	196	2.57	0.88			
	≥20	7	3.00	0.82	-1.27	.09	-0.51
6.b.	<20	195	2.69	0.99			
	≥20	7	2.57	0.98	0.32	.38	0.12
8.a.	<20	193	5.33	1.32			
	≥20	7	4.43	1.81	1.76	.04	0.57
8.b.	<20	194	5.00	1.27			
	≥20	7	3.71	2.14	2.55	<.01	0.73
10.b.	<20	191	3.14	0.76			
	≥20	6	2.50	1.23	1.97	.03	0.63
10.e.	<20	192	2.57	0.90			
	≥20	6	2.67	1.03	-0.27	.61	-0.10
10.f.	<20	190	2.94	0.93			
	≥20	6	2.67	1.21	0.71	.24	0.25
11.b.	<20	186	2.73	0.91			
	≥20	6	1.67	0.82	2.82	<.01	1.22

Engagement Questions 2 and 3: Relationship between Interventions and Engagement

This question yielded two null hypotheses, the first being that students participating in zero interventions would not exhibit different levels of engagement than those participating in one intervention, and that students participating in more than one intervention would not be any more engaged than those participating in one intervention. Table 8 details student participation in the six possible permutations of intervention along with response rates to NSSE and first-to-second year retention rates (this table will be referenced for Retention Question 2 as well).

In the table, the percent for NSSE response rate or retention rate refers to the number of respondents (or retained students) divided by the number of individuals in that particular intervention. For this test, a NSSE response population of 513 was used for comparison purposes. This is the number of respondents to question 1.f., and was recommended (T. Elling, personal communication, May, 2010) as a suitable marker for engagement because it was the only question that all students who took the survey responded to.

The institutional response rate was 16.6% in comparison to the 2008 national average response rate of 35% for freshmen across 758 institutions (NSSE, 2008). In all cases, regardless of number or type of intervention, the NSSE response rate is lower at the institution studied than the national average.

Table 8

Student Participation in Interventions, NSSE, and Retention

Intervention (n)	NSSE response *n* (%)	Retained *n* (%)
Zero (205)	27 (13.1)	130 (63.4)
SOAR (1659)	262 (15.8)	1273 (76.7)
Freshman Seminar (59)	11 (18.6)	50 (84.7)
Learning Community (17)	5 (29.4)	11 (64.7)
SOAR + Fresh. Sem. (452)	62 (13.7)	354 (78.3)
SOAR + L.C. (698)	146 (20.9)	580 (83.1)

A chi-square test for independence was selected for hypotheses 2 and 3, which can be summarized as there is no relationship between intervention and engagement. The test is suitable because the two variables (responded to NSSE or did not) are independent for different populations depending on the number of interventions. In this case, engagement is represented by response rate to the NSSE survey, which for this population already been shown to be below the national average. The test revealed no significant relationship between engagement and interventions, χ^2 (1, n = 1940) = 0.94, p > .05; that is, the differing response rates to NSSE by students in either zero or one intervention may have occurred simply by chance. When analyzed individually, none of the interventions reached statistical significance when compared to zero interventions, therefore the hypothesis fails to be rejected. Table 9 shows the observed and expected frequencies.

Table 9

Observed and Expected Frequencies for Zero vs. One Intervention

Outcome	f_o Zero	f_e Zero	f_o One	f_e One
Took *NSSE*	27	32.2	278	272.8
Did Not	178	172.7	1457	1462.3

A similar test for one intervention versus two interventions provided similar results. No statistically significant differences were found in the response rates for students taking one or two interventions, χ^2 (1, n = 2885) = 1.73, $p > .05$. Table 10 provides the frequency data, and the hypothesis that there is no difference in engagement depending on the number of interventions fails to be rejected.

Table 10

Observed and Expected Frequencies for One vs. Two Interventions (N= 2885)

Outcome	f_o One	f_e One	f_o Two	f_e Two
Took *NSSE*	278	292.2	208	193.8
Did Not	1457	1442.5	942	956.5

NSSE Constructs and Interventions

A multivariate analysis of variance (MANOVA) was performed to determine if the groups are different when compared to the two constructs (time management and interaction quality) identified within the NSSE items. In this case, the test was designed to see if levels of engagement were affected by participation in the specific interventions. For this test, the items making up the constructs were averaged to arrive at a single mean score for each construct. Table 11 provides the mean scores and standard deviations for the groups by intervention.

Table 11

NSSE Construct Scores by Intervention

Group	Intervention	*N*	*M*	*SD*
Time Management				
	Zero	24	3.31	1.05
	SOAR only	245	3.15	1.04
	LC only	5	2.80	0.27
	FRSEM only	11	3.05	0.85
	SOAR + LC	138	3.28	1.07
	SOAR + FRSEM	57	3.19	1.01
Interaction Quality				
	Zero	24	3.28	0.66
	SOAR only	245	3.11	0.54
	LC only	5	3.01	0.41
	FRSEM only	11	3.05	0.85
	SOAR + LC	138	3.32	0.57
	SOAR + FRSEM	57	3.23	0.53

Prior to running the MANOVA test, several assumption tests were performed. First, Box's test of equality of covariance was run to test if the matrices of covariance for the dependent variables were the same across the groups. For this test, the assumption of equal covariance was met, F (15, 2707) = 0.94, p = .52. Next, Wilks' Lambda tested if the means of the two constructs were the same across the groups. In this case, the test revealed that the means were not the same, F (10, 946) = 1.60, p = .10, $\acute{\eta}^2$ = 0.17, allowing the MANOVA to proceed to the next assumption test. Levene's test for equality of error variance also produced non-significant results for both variables. For time management, F (5, 474) = 1.14, p = .34, and for interaction quality, F (5, 474) = 1.00, p = .42, therefore this assumption was also met.

The MANOVA test revealed a significant effect between interaction quality and intervention, F (5, 474) = 2.86, p = .015, $\acute{\eta}^2$ = 0.029. Tukey's HSD post-hoc test was run

to determine which of the mean differences were significant. In this case, the mean difference for interaction quality between students attending SOAR only and SOAR in conjunction with a learning community was significant with a mean difference of .205 at $p < .05$.

The tests for these two engagement questions demonstrated that while the number of interventions a student participated in was not significantly related to their engagement as measured by simple response to the NSSE survey, students who participated in SOAR and a learning community were significantly more likely to report higher scores in the quality of their interactions than those who attended the SOAR program by itself.

Research Questions and Hypotheses Relating to Retention

The research questions relating to student retention and institutional intervention were as follows:

1) Is there a relationship between student characteristics, participation in the institutional interventions, and first-to-second year retention?
2) To what extent does participation in more than one of the selected institutional interventions affect retention?
3) Is there a relationship between level of engagement and retention?

Retention Question 1: Relationship between Student Characteristics and Retention

Retention question one resulted in a null hypothesis stating that there would be no difference in the level of retention for students across the selected characteristics. Table 12 provides the retention results for the different characteristics as well as interventions.

Table 12

Retained Student Characteristics by Intervention N=3090

Characteristic (*N*)	Zero	One	Two	Retained
Male (1461)	60	604	479	1143
Female (1629)	70	729	455	1254
White (2269)	58	993	681	1732
Afr. Am. (467)	16	168	194	378
Hispanic (117)	4	58	32	94
Live On Campus (2322)	44	938	838	1820
Live Off Campus (768)	86	395	96	577
Did Not Work (496)	30	247	219	416
Worked < 20 Hours (159)	8	87	64	132
Worked ≥ 20 Hours (60)	4	35	21	47

The objective for the first set of tests within this hypothesis was to determine if retained students differed in composition from the general population and, as in engagement question one, utilized the chi-square for goodness of fit. With regards to gender, number of hours worked, race, and residence, no significant differences in retention rate were revealed when compared to the general population:

Gender: χ^2 (1, n = 2397) = 0.14, p >.05

Hours worked: χ^2 (2, n = 595) = 0.2, p > .05

Race: χ^2 (2, n = 2397) = 1.23, p > .05

Residence: χ^2 (1, n = 2397) = 0.86, p > 05.

As with the engagement variable, a z-test was used to examine if there were significant differences in Projected Grade Point Index (PGI) between the retained students and the general student population. In this case, the retained students had a statistically significant higher PGI of 2.68 (SD = 0.38) against the population mean of

2.66 (*SD* = 0.38), $z = 2.25$, $p = 0.02$; however for practical purposes the difference is not relevant.

For unmet need, a median comparison was again utilized. In this case, the median unmet need for the retained students was $2050 as compared to the general student population unmet need median of $2330, a difference of $280 or 12%.

Within Group Differences

Table 13 shows the differing rates at which students were retained by their characteristics and number of interventions. For every characteristic, gains in retention were realized for students who participated in the institutional interventions over those who did not participate, and a combination of interventions yielded higher retention rates still.

Table 13

Retention Rates by Characteristic and Intervention

Characteristic	Zero	One	Two	Total
Total Participated *n*	205	1735	1150	3090
Total Retained *n*	130	1333	934	2397
Total Retained %	63.4	76.8	81.2	77.5
Male	60.6	77.6	82.0	78.2
Female	66.0	76.1	80.3	76.9
White	61.7	75.1	79.8	76.3
African-American	43.2	81.9	86.2	80.9
Hispanic	80.0*	78.3	84.2	80.3
Live On Campus	65.6	76.6	81.2	78.3
Live Off Campus	62.3	77.1	81.3	75.1
Did Not Work	76.6	82.1	86.7	83.8
Work <20	62.5	82.7	85.9	83.0
Work ≥ 20	75.0*	77.1	81.0	78.3

* $n \leq 5$

Retention Question 2: Interventions and Retention

Consistent with the theory, and as illustrated in Table 13, students who did not participate in any of the interventions had the worst retention rate (63.4%), while those participating in one or more interventions all retained at higher rates. When analyzed by *specific* interventions, the descriptive statistics showed interesting distinctions in retention rates depending on the number and type of intervention (refer to Table 8). Students attending only the extended orientation (n = 1273) were retained at a much higher rate of 76.7%, while those attending both the extended orientation and either a freshman seminar or a learning community were retained at rates even higher still (78.3% and 83.1%, respectively). Students who took only a freshman seminar were retained at the highest rate overall (84.7%) and those who enrolled in a learning community without the benefit of the orientation had a rate (64.7%) nearly as poor as those students who did nothing at all. However, both those categories, freshman seminar only and learning community only, had relatively small numbers participating when compared to participation numbers in the other categories of intervention, so percentages must be interpreted with caution.

A two sample z-test for analyzing the difference between proportions was employed to identify statistically significant differences between the interventions and the retention rates. The numbers of students in the sample was sufficient to assume a normal distribution, thus the test is appropriate. In this case, the number of students participating in an intervention represents the "tests" and the number of students retained represents the "successes". The analysis confirmed that when compared to zero interventions, participation in one or two interventions yielded significantly better retention rates. The

exception was students who participated in learning communities only, who did have a slightly higher retention rate, but failed to achieve a significant difference. When comparing one intervention to two interventions, students attending SOAR and a learning community were significantly more likely to be retained than those who attended SOAR only. This was also true for student who participated in a learning community only when compared to those who attended SOAR plus the learning community. The combination yielded better retention results. Finally, when comparing students participating in multiple interventions, those students in the SOAR/learning community combination has statistically significant better retention than those in the SOAR/freshman seminar group. Table 14 provides the detailed *z*-scores.

Table 14

Equality of Two Proportions by Intervention (z scores)

	Zero	SOAR	LC	FRSEM	SOAR+LC	SOAR+FRSEM
Zero	---	-4.17**	-0.11	-3.1*	-6.04**	-4.02**
SOAR	---	---	1.17	0.33	-3.44**	-0.71
LC	---	---	---	-1.83	-1.98*	-1.33
FRSEM	---	---	---	---	0.33	1.14
SOAR+LC	---	---	---	---	----	-2.03*

* $p < .05$ ** $p < .01$

Retention Question 3: Relationship between Engagement and Retention

When looking at engagement as a predictor for retention, the individual responses to NSSE did not necessarily provide a good predictor. Differences in the amount of time students spent doing lengthy problems or preparing for class did not seem to make a statistically significant difference in retention. The quality of relationships with other students did affect retention, $t(479) = 3.29$, $p < .05$ with a moderate effect size, $d = 0.42$. Students who reported higher levels of institutional emphasis on attending campus events

outside of class retained at higher rates and also achieved significance, t (461) = 3.41, p = .001 with a moderate effect size, d = 0.46. Finally, students who felt more strongly that their education was giving them skills and knowledge they needed for work success retained at a higher rate, t (455) = 2.70, p = .002, again with a moderate effect d = 0.38.

Table 15

Differences in NSSE Item Responses for Retained vs. Departing Students

Item #	Status	*N*	*M*	*SD*	*t*	*p*	*d*
Time management							
4.a.	Retained	409	2.56	1.07			
	Not Retained	65	2.51	0.95	-0.34	.74	0.05
9.a.	Retained	407	3.86	1.49			
	Not Retained	62	3.79	1.38	-0.35	.73	0.05
Interaction quality							
1.o	Retained	420	2.17	0.85			
	Not Retained	65	2.11	0.97	-0.55	.58	0.07
1.t.	Retained	420	2.61	0.86			
	Not Retained	65	2.55	0.85	-0.45	.66	0.07
6.b.	Retained	412	2.70	1.00			
	Not Retained	65	2.70	0.98	-0.07	.95	< 0.01
8.a.	Retained	409	5.35	1.33			
	Not Retained	62	4.74	1.58	-3.29	<.01	0.42
8.b.	Retained	408	4.90	1.30			
	Not Retained	62	4.82	1.29	-0.45	.65	0.06
10.b.	Retained	404	3.10	0.74			
	Not Retained	61	2.97	0.88	-1.31	.19	0.16
10.e.	Retained	403	2.59	0.91			
	Not Retained	61	2.62	0.82	0.24	.81	0.03
10.f.	Retained	402	2.90	0.91			
	Not Retained	61	2.48	0.92	-3.41	<.01	0.46
11.b.	Retained	398	2.75	0.88			
	Not Retained	59	2.42	0.86	-2.70	<.01	0.38

A MANOVA test was used to test the relationship between the two principal components, time management and interaction quality, against retention. Although a point-biserial correlation test was initially considered for the dichotomous variable of retention, the test was rejected in favor of the more sensitive MANOVA initially suggested by the Keup (2006) study (C. Wang, personal communication, September 17, 2010) to reduce the chance of Type I error. A standardized factor score was created for time management and interaction quality. The value is the mean score of individual responses to the items which comprise the two components. Table 16 provides the descriptive statistics.

Table 16

Time Management and Interaction Quality vs. Retention

Variable	*N*	*M*	*SD*
Time Management			
Retained	425	3.20	1.04
Departed	130	3.12	1.01
Interaction Quality			
Retained	415	3.23	0.55
Departed	130	3.02	0.60

Assumption testing was satisfactory, with Levene's test of equality yielding non-significant results for both variables. For time management, F (1, 543) = 0.48, p = .49, and for interaction quality, F (1, 543) = 1.57, p = .21. The MANOVA demonstrated no significant difference between retained and departed students for time management, F(1, 543) = 0.60, p = .44, $\acute{\eta}^2$ = .001, but did show a significant difference between retained and departed student in terms of interaction quality, F (1, 543) = 13.55, $p < .05$, $\acute{\eta}^2$ = .02.

CHAPTER 5: DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

Despite decades of research and implementation of resulting programs to improve college student retention, the success rate of American college students remains lower than desired. Student retention and persistence to degree remain areas ripe for study as institutions seek to improve their performance in response to regulatory and public demands for accountability. Jones and Braxton (2009-2010) point to a well defined literature base regarding things that institutions do to improve retention, but a less convincing compendium regarding the results of those efforts. This study adds to the literature base by examining the results of those institutional efforts.

The purpose of this study was to examine the effect multiple institutional interventions designed to assist students' transition to successful college life had upon student engagement and retention. Using the National Survey of Student Engagement (NSSE) as an indicator of engagement, the relationships between certain student characteristics and engagement, as well as the impact participation in the institutional interventions had upon engagement, were analyzed. Those same characteristics were analyzed for relationships with first year retention, and the interaction of engagement and retention was also studied. In this chapter, the findings of the study will be discussed, the implications the findings might have for the institution offering the interventions, and the possibilities for further research suggested by the results in relation to new research.

Engagement

Tinto's theory of student departure suggests that students experience distinct psychological changes as they proceed through their freshman year of college. Initially, students fear the separation from their previous lives, then transition to a new way of being, and finally incorporate the academic and social values of the institution. Failure to successfully transit these stages may result in a decision to depart the institution. The combination of the characteristics a student brings to college, along with the experiences the student has at the college, result in assisting the student successfully negotiate each stage. Therefore, institutions must make efforts to "engage" the student, academically and socially. These efforts help the student move from a simple commitment to attend college, to a decision to graduate from the particular college. This theory enjoys "near paradigmatic status" (Braxton & Lien, 2000); although much research has been done since Tinto first wrote about it in the 1970s, and Tinto himself has suggested that the theory needs more subtle gradations to account for the changing demographics and dynamics of college education in the 21st century, the basic premise remains sound, and forms the basis for many institutional efforts aimed at improving retention and persistence to degree.

The study utilized the NSSE instrument administered to the freshman class of 2008. The literature suggested certain items within the survey were associated with retention, and those items formed a proxy for student engagement. A principal component test was performed on the 14 items suggested by the literature, and two factors were determined to account for nearly 40% of the variance. These two factors were labeled "time management" and "interaction quality". Three items were eliminated

from final analysis as not connected to either construct. For purposes of this study, it was reasonable to conclude that students who responded with high item scores on the 11 items would fit the definition of an engaged student and were suitable for further analysis.

Student Characteristics

The incoming class of 2008 at the institution studied had 3090 students. The population was divided 53/47 female to male, and roughly three fourths of the students identified themselves as White. Three quarters of the students lived on campus, and the majority of students who responded to an institutional survey in the first term indicated that they were not working, with only 12% indicating that they worked 20 or more hours per week, a time commitment that the literature suggests is a "break point" for student retention, and by extension, a serious limitation in the amount of time a student can spend engaging in the academic and social life of the campus.

Testing revealed that there were significant differences in the response rates for males and females and by the number of hours worked but no differences were observed in response rates for race or residency. Females were significantly more likely to respond than males, and students working fewer than 20 hours per week responded less frequently than might have been expected. This last statement does not appear to support the theory that the amount of time working per week is tied to engagement. However, this finding is limited because it does not differentiate between working on campus and working off campus, with working on campus theorized to be less detrimental to student engagement. No statistically significant differences were found in response rates between different racial groups or place of residence.

The Projected Grade Index (PGI) of the students responding to NSSE did not differ significantly from the PGI of the population. It could be argued that because NSSE is given in the second semester using first semester GPA records might provide a more accurate representation of the link between academic success and engagement. Certainly the possibility that the more successful a student is academically once in college the more likely he/she is to persist has been posited in the literature. Finally, research into student retention has lately begun to include economic factors. When Tinto did his original work, the cost of higher education was significantly lower, as was the amount of borrowing students did to finance their education. Research has now been extended to include financial need when discussing retention, as the stress of increased borrowing and the need to work to pay tuition while a student both have negative impacts on retention. In the study however, there were no differences in the median amount of unmet need NSSE respondents had versus the unmet need in the general population.

Within the NSSE items, there were differences observed by student characteristics, with female students more likely to report that the institution supported them academically, and that they also more likely to talk with a faculty member about their career and attend an event on campus, although the last two behaviors did not meet the test of statistical significance. When comparing racial groups, there were differences between the groups for attendance at campus events (interaction quality) and the number of problem sets taking more than one hour to complete (time management), however post-hoc tests failed to show that mean scores for Whites were significantly different from African-American or Hispanic students, leading the researcher to conclude that the

differences existed between self-identified racial groups with much smaller numbers within the population.

Students living on campus were more likely to have exercised, feel they acquired job related skills, and have higher quality relationships with other students than those living off campus. The ubiquity of student affairs programming, including athletics and team building, along with the close quarters freshmen tend to live in make two of these results unsurprising, although the idea that students living on campus felt they had acquired job related skills over commuter students, who tend to work at higher rates and would thus presumably actually be acquiring job skills through work, is intriguing, and perhaps warrants further study. This finding was echoed when analyzing students by the number of hours worked, with students working fewer than 20 hours more likely to report that they were acquiring job skills. This suggests that students look at their current employment as temporary and of little value for acquiring skills needed in their chosen career fields. Working fewer hours also resulted in students reporting that the institution supported them academically, and that their relationships with both faculty and other students were better than those working 20 or more hours.

Interventions

Student response rates to the NSSE survey were significantly lower at the institution under study than the nationally reported average; in fact, the student response rate of 16.6% was less than half of the 35% national rate from 758 institutions. This pattern was reflected when analyzing the student response rate by participation in the various interventions. While students participating in zero interventions had the lowest response rate of 13.1% (27 of 205), it was not by much, as students in the SOAR plus

Freshman Seminar group responded at only a 13.7% rate (62 of 452). This challenged the assumption that participation in the interventions would increase engagement; however, students participating in SOAR and a learning community did respond at the higher rate of 20.9% (146 of 698). In addition, students who participated in a learning community only had the highest response rate of 29.4%, but with a total population of only 17 students, the percentage must be interpreted with caution. The results did begin to point towards learning communities as an intervention that produced more satisfactory results in engagement.

At the analysis stage, however, Chi-square tests of independence did not reveal any significant relationship between the number of interventions and the NSSE response rate; that is observed and expected frequencies based upon number and type of interventions were not significantly different and may be explained simply by chance. Still, the jump in response rates for students involved in some way with learning communities was intriguing. The question became, would these results hold true for retention.

Testing the NSSE Constructs against Interventions

A MANOVA test was used to analyze if the responses to the NSSE survey, as categorized into the two factors (time management and interaction quality), would be different depending on the number and type of intervention. In the event, a significant difference for interaction quality mean scores was found, with post-hoc tests identifying students who participated in SOAR and a learning community reporting higher mean scores than those who participated in SOAR only. Once again, participation in the

multiple intervention of SOAR plus a learning community was associated with engagement.

Retention

Retention remains a critical issue for higher education, as costs and demands for accountability increase. With so much of the effect of higher education difficult to quantify, retention is a number that can be reliably and regularly reported and compared among institutions. College student retention will continue to be an important measure of institutional effectiveness and research in this area is likely to continue unabated.

Student Characteristics

The analysis of the relationship between student characteristics and retention revealed no significant differences in retention rates than what might be expected. A small difference in the PGI was detected, but the amount was small enough to be regarded as not practically different, and the unmet need of retained students was about 12% lower than the entire population of the entering class. This suggested that economics might indeed play a role in a student's decision to return or depart, as students struggle to make ends meet, students with less unmet need are better able to afford continuing their education.

Interventions

Studying the different student groups through the lens of interventions, retention improved for every characteristic as the number of interventions increased. Students participating in two interventions always retained at higher rates than those participating in one, and those participating in one always returned at higher rates than those who participated in none. In the analysis, the largest gains were realized between zero and one

intervention, however large gains were discovered between one and two interventions. For African-American students, the difference between zero, one and two interventions was startling, going from a 43.2% retention rate for zero interventions to 86.2% for two interventions. The increases in retention rate were found to be statistically significant practically across the board, with the combination of SOAR and a learning community having the highest retention rate of all, and one that was significantly higher than the SOAR/freshman seminar combination.

Relationship between Engagement and Retention

In analyzing retained versus departing students using individual item responses to the NSSE instrument, neither of the time management items was directly associated with retention, while several interaction quality items showed mean score differences for retained students that were statistically significantly higher. Analysis showed that retained students were significantly more likely to report higher mean scores for interaction quality items on the NSSE survey than students who left the institution, suggesting that engagement and retention are connected.

Implications for the Institution

This study identified learning communities when combined with a comprehensive summer orientation program (SOAR) to be the most effective intervention associated with the desired outcome, retention. Whalen, Saunders and Shelley (2009-2010) found student participation in a learning community to be a reliable predictor of improved retention over students who do not participate in a learning community. However, the effect size was fairly low, and suggested that a more complex interaction was working.

That institutional experiences play a role in the decision to stay or leave a college was clear in both the literature and the study. To what extent remained in doubt. Jones and Braxton (2009 – 2010) opined that because public institutions generally have lower retention rates than private ones, more effort needed to be made at publics to provide programming designed to reduce student attrition, but found no significant differences between the type of control in their (admittedly small) survey of 54 institutions. The authors did make a case for more effective institutional research programs to assess the effectiveness of the various programs designed to improve retention (Jones & Braxton). The institution under study did have dedicated research resources assessing a variety of academic and student affairs programming, and it was apparent that the communication of the data was reaching decision makers on campus. Increasing resources to perform this type of assessment would benefit the institution by allowing more subtle decisions to be made about programming for smaller demographic groups (or even individual students), and would likely promote a scholarship of practice to be shared with other institutions.

A second implication for the institution comes from some recent work by Weissman and McGill (2008), who suggested that student typology would be a valuable lens with which to view student retention efforts. In their study of first-year seminars, the authors found no significant differences between students in different programs. However, when observing types of students, certain types of students clearly benefitted from the intervention. When seen in combination with the work of Jamelske (2009) and Potts & Schultz (2008), a need for more individualized plans of intervention for students seems to be emerging. Tinto himself called for a change in institutional attitudes a decade ago, writing that one cannot “inoculate” students against departure.

The work of Potts and Schultz, which found that first-year seminar significantly improved at-risk student retention rates is in alignment with this study's findings that African-American students were retained at much higher rates when they participated in interventions designed to increase engagement. The difficulties many African-American students have at predominantly White institutions is well documented (Pascarella & Terenzini, 2005). The institution under study makes special efforts to engage traditionally disadvantaged student groups, including racial minorities, and upon closer examination it is likely that African-American students participating in the multiple interventions may also avail themselves of additional support services offered by the Center for Academic Excellence including supplemental instruction and strategies for first generation college students. But there is little disputing the fact that African-American students made significant gains in retention when involved in multiple interventions.

Recommendations for Further Study

Institutions continue to seek effective programs to assist students persist in college, and look for ways to predict who will stay and who will go. Davidson, Beck and Milligan (2009) noted the difficulties inherent in trying to do both (predict and program). As Tinto and other theorists have stressed, the decision to depart is complex and personal. Davidson et al. went further, suggesting that applying findings across institutions should be approached with caution, as variables that affect one group of students may not be associated with another group, and that effective programs at one school may be disappointing at others. In the end, student departure is an individual decision.

Institutions, of course, prefer to aggregate data and create programs that research and practice suggest work at other similar institutions to prevent students from dropping

out. Creating programs designed to impact the majority of students is the most logical response for an organization as complex as a university. In the case of the institution studied, the results of the programming, and the benefits to students of participating in more than one intervention, were clear. The study could be repeated longitudinally to determine if gains in retention are typical for students in those interventions, and additional controls could be built in to better account for pre-college characteristics that the literature supports as associated with retention.

Engagement, however, is a different matter. Davidson et al. (2009-2010) wrote that no widely accepted definitions exist for academic and social integration, and proposed a new tool for predicting student persistence, the College Persistence Questionnaire (CPQ). The CPQ is designed, according to the authors, to "provide administrators with information allowing them to concentrate funds and resources that most need attention *at their institution*" (p. 386, italics added). Rather than make generalized conclusions about the variables (i.e., students who live on campus are retained at higher rates than those who live off campus), the CPQ is supposed to permit the institution to focus attention at smaller subsets of students. For example, the authors suggested that minority students may make departure decisions on criteria different than the student body as a whole (p. 387). When looking at the results of this study, the retention gains made by African-American students when participating in one or more interventions were huge; that result in and of itself warrants further study. The CPQ is designed to both clarify the operational definitions of commonly used terms surrounding retention research, and provide administrators with actionable information to reduce

student departure. A pilot study at the institution of the CPQ might be advisable to see if that is true and how it can assist an already effective set of programs.

The NSSE instrument continues to be analyzed for efficacy as well. Practices that support the construct of engagement, as tested in NSSE, and the results of tens of thousands of NSSE surveys, provide a rich data base for further analysis. Ewell (n.d.), studied in 2008 how institutions use NSSE results. Institutions varied in size and scope, and used NSSE in a variety of ways. Perhaps the most interesting was Pace University in New York using NSSE results to improve the sophomore experience. Traditionally, the focus on freshman retention has resulted in a sophomore slump, and an emerging literature base is developing about how institutions can assist sophomores. Students who have been extensively recruited, and provided with expensive and intensive programming to get "engaged" with the institution so they will return, are unceremoniously cut loose when they arrive back on campus for a second year. The institution has turned its focus onto its new incoming class. Thus a study examining the long term effects of psychological integration into the institution would be in order to determine what those effects are and if the interventions had any lasting effects..

The most convincing finding this study produced was the effect on retention when combining a learning community with an extended orientation. The concept of a compounding effect of interventions was posited by Smith & Windham (2009), and certainly the learning community, with its year-long period, offers the best chance at truly assisting students become integrated with college life. In fact, the learning community program at the institution studied included a freshman seminar embedded within it, and the orientation/learning community retention rate was higher than the

orientation/freshman seminar-only combination. One can see that there are indeed positive effects of having students participate in multiple interventions. Although the link is not causative, Tinto's theory suggested that students needed institutional assistance to pass through the three psychological stages, and the study revealed that programs designed to parallel those stages do in fact yield improvements in retention for a largely traditional-aged and residential population. But institutional planning needs to be centered on the composition of the particular student body: commuters and non-traditional aged students have very different priorities and needs when compared to resident, traditional aged students. Retention research will seemingly be always limited to single institution studies, because student bodies and institutional contexts are so different it will always be difficult to generalize results.

Another avenue for future research involves better sub-dividing the student population by its working characteristics. This study did not incorporate NSSE data on working, nor did it fully explore the data that Student Affairs Research may have been able to provide to allow a more meaningful examination of this increasingly important variable. As students work to pay for increasing tuition and fees, the location of the work performed is likely of as great an importance as the number of hours worked. Orszag, Orszag* and Whitmore (2001) noted that working part-time, on-campus was associated with positive outcomes both in the theoretical work of Tinto and Astin, and in empirical research from the late 1980s and early 1990s (* Peter R. Orszag, Director of the Office of Management and Budget for President Obama). The results of this study were clearly limited by the broad categories utilized to describe student employment. Future research

should take into account smaller units of hours worked and location of that work to provide more helpful data for the effects of employment on student retention.

Finally, examining the role student expectations plays in engagement and retention. Expectancy theory holds that people become motivated to do something if they think they will be able to perform it well enough to achieve a desirable outcome (Friedman & Mandel, 2009-2010). If freshmen set attainable academic and social goals, retention may be improved. Although the authors did not find social motivation to be a predictor of retention, it is possible they were looking in the wrong place. Empirical support for Tinto's theory is mixed (Braxton & Hirschy, 2005, Friedman & Mandel, 2009-2010), but the concepts of academic and social integration exert a powerful pull on programmatic design; they just seem to make sense, and if one could somehow create truly accurate and measurable definitions for the two ideas, then all the subsequent research would simply fall into place. That, at least, seems to be an underlying thread when reading the literature base and speaking with practitioners: like a hologram, engagement is right there in front of us, just out of reach, and disappears just when we think we can touch it.

Administrators charged with improving the student experience must have reliable information to make decisions about enrollment, programming, and student persistence. The gap in lifetime earnings between those who attend college and those who do not is increasing regularly. As more students demand a college education, as the nation views a college education as the ticket to success, and as the cost of that education rises, institutions must redouble their efforts to understand their students, both as groups and as individuals, and create programming that enables them to succeed. Students completing a

rigorous and engaging collegiate experience will form the basis of the enlightened and informed citizenry required for the 21st century.

REFERENCES

Allen, D. (1999, August). Desire to finish college: An empirical link between motivation and persistence. *Research in Higher Education (40)*4, 461-465. Retrieved October 30, 2008 from Academic Search Premier (Accession number 2178386)

Astin, A.W. (1984). Student involvement: A developmental theory for higher education. *The Journal of College Student Personnel, 25*(4), pp. 297-307.

Astin, A.W. (1996, March/April). "Involvement in Learning" revisited: Lessons we have learned. *Journal of College Student Development 37*(2), pp.122-133.

Astin, A.W., & Oseguera, L. (2005). Pre-college and institutional influences on degree attainment. In A. Seidman (Ed.) *College Student Retention* (pp. 107-127). Westport, CT: Praeger.

Babbitt, T. (2007). The impact of one-hour freshman seminars on student success at a research university. (Doctoral dissertation, University of New Mexico, 2007). *Dissertation Abstracts International,* DAI-A 68/07, January 2008.

Bailey, T., & Alfonso, M. (2005, January). *Paths to persistence: An analysis of research on program effectiveness at community colleges.* Indianapolis, IN: The Lumina Foundation for Education. (ERIC Document Reproduction Service No. ED484239).

Baum. S., & Ma, J. (2009). Trends in higher education pricing. *College Board Trends in Higher Education Series.* Retrieved April 11, 2010 from http://www.trends-collegeboard.com/college_pricing/pdf/2009_Trends_College_Pricing.pdf

Bean, J.P. (2005). Nine themes of college student retention. In A. Seidman (Ed.) *College Student Retention* (pp. 107-127). Westport, CT: Praeger.

Berger, J.B., & Lyon, S.C.(2005). Past to present: A historical look at retention. In A. Seidman (Ed.) *College Student Retention* (pp. 1-29). Westport, CT: Praeger.

Bill & Melinda Gates Foundation. (2009). *National policy organizations launch intensive efforts to address the nation's low college completion rates.* Retrieved December 18, 2009 from http://www.gatesfoundation.org

Braxton, J.M., & Hirschy, A.M. (2005). Theoretical developments in the study of college student departure. In A. Seidman (Ed.) *College Student Retention* (pp. 61-87). Westport, CT: Praeger.

Braxton, J.M., & Lee, S.D. (2005). Toward reliable knowledge about college student departure. In A. Seidman (Ed.) *College Student Retention* (pp. 107-127). Westport, CT: Praeger.

Braxton, J., & Lien, L. (2000). The viability of academic integration as a central construct in Tinto's interactionalist theory of college student departure. In J. Braxton (Ed.), *Reworking the student departure puzzle* (pp. 11- 28). Nashville, TN: Vanderbilt University Press.

Braxton, J.M., Sullivan, A.S., & Johnson, R.M. (1997). Appraising Tinto's theory of college student departure. In J.C. Smith (Ed.) *Higher Education: Handbook of Theory and Practice* (pp. 107-164). New York: Agathon Press.

Cabrera, A., Nora, A., & Castañeda, M. (1993). College persistence: Structural equations modeling test of an integrated model of student retention [Electronic version]. *The Journal of Higher Education, 64,* 123-139.

Chasteen, B.C. (2005). A new student orientation program: Its relationship to retention and academic performance. (Doctoral dissertation, University of Missouri-Columbia, 2005). *Dissertation Abstracts International,* DAI-A 66/09, Mar, 2006

Chen, P-S. D., Gonyea, R.M., Sarraf, S.A., BrckaLorenz, A., Korkmaz, A., Lambert, A.D., Shoup R., & Williams, J.M. (2009). Analyzing and interpreting NSSE data. *New Directions for Institutional Research, 141*. pp. 35-54.

Chickering, A.W., & Gamson, Z.F. (1987). *Seven principles for good practive in undergraduate education.* Retrieved April 17, 2010 from http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/7princip.htm

Crissman-Ishler, J.L., & Upcraft, M.L. (2005). The keys to first-year student persistence. In M.L. Upcraft, J.N. Gardner, & B.O. Barefoot (Eds.) *Challenging and Supporting the First-Year Student* (pp. 27- 46). San Francisco:Jossey-Bass.

DeBerard, M.S., Spielmans, G.I., & Ulka, D.C. (2004, March). Predictors of academic achievement and retention among college freshmen: A longitudinal study. *College Student Journal, 38*(1), pp-66-80. Retrieved October 9, 2009 from Academic Search Premier. Accession No. 12844795.

Dickeson, R.C. (n.d.). Frequently asked questions about college costs. *The Secretary of Education's Commission on Higher Education.* Retrieved April 7, 2009 from http://www.ed.gov/about/bdscomm/list/hiedfuture/reports/dickeson2.pdf?exp=0

Dundes, L. & Marx, J. (2006-2007). Balancing work and academics in college: Why do students working 10 to 19 hours per week excel? *Journal of College Student Retention 8*(1), pp. 107-120.

Eck, J.C., Edge, H., & Stephenson, K. (2007, May). Investigating types of student engagement through living-learning communities: The perspective of Rollins College. *Assessment Update, 19* (3), pp. 6-8. Retrieved October 9, 2009 from Academic Search Premier. Accession number 25793633.

Elkins, S., Braxton, J., & James, G. (2000). Tinto's separation stage and its influence on first-semester college student persistence. *Research in higher education. 41* (2). Retrieved November 17, 2008 from Academic Search Premier. Accession Number 3020469.

Evans, N.J., Forney, D.S., & Guido-DiBrito, F. (1998). *Student development in college: Theory, research and practice.* San Francisco: Jossey-Bass.

Ewing, P.T. (n.d.) *Using NSSE to assess and improve undergraduate education: Lessons from the field 2009.* Bloomington, IN: Indiana University Center for Postsecondary Research, National Survey of Student Engagement. Retrieved September 8, 2010 from https://connect2.uncc.edu/ids70/,DanaInfo=csaweb108v.csa.com+view_record.php?id=2&recnum=0&log=from_res&SID=8qeqq1jc8cn0cetta8cv4bm6e4&mark_id=search%3A2%3A0%2C0%2C1. Accession number ED506656.

Fidler, P.P., & Moore, P.S. (1996). A comparison of effects of campus residence and freshman seminar attendance on freshman dropout rates. *Journal of the Freshman Year Experience, 8*(2), pp. 7-16.

Friedman, B.A. & Mandel, R. G. (2009-2010) The prediction of college student academic performance and retention: Application of expectancy and goal setting theories. *Journal of college student retention 11*(2), pp. 227-246.

Furr, S.R., & Elling, T.W. (2000). The influence of work on college student development. *NASPA Journal, 37*(2), pp. 454-470.

Gerkin, D (2009). The impact of a first-year learning community on student persistence: Perceptions of community college students (Doctoral dissertation, Walden University, 2009). *Dissertation Abstracts International,* DAI-A 70/04, Oct. 2009.

Glatthorn, A.A., & Joyner, R.L. (2005). *Writing the winning thesis or dissertation,* 2nd Ed. Thousand Oaks, CA: Corwin Press.

Gordon, J., Ludlum, J., Hoey, J.J. (2008, Feb.) Validating NSSE against student outcomes: are they related*? Research in Higher Education, 49* (1), pp. 19-39.

Gravetter, F.J., & Wallnau, L.B. (2007). *Statistics for the behavioral sciences,* 7th Ed. Belmont, CA: Thomson/Wadsworth.

Hendel, D.D. (2001). *The relative contribution of participating in a first-year seminar on student satisfaction and retention into the sophomore year.* Paper presented at the annual meeting of the American Educational Research Association, Seattle, WA. (ERIC Document Reproduction Service No. ED 453724).

Hopkins, T.H. (2007). Development and validation of the college student departure inventory. (Doctoral dissertation, University of North Carolina at Charlotte, 2007).

Hunter, M.S., & Linder, C.W. (2005). First-year seminars. In M.L. Upcraft, J.N. Gardner, & B.O. Barefoot (Eds.) *Challenging and Supporting the First-Year Student*, pp. 27- 46. San Francisco:Jossey-Bass.

Jacobsen, J., Olsen, C., Rice, J.K., Sweetland, S., Ralph, J. (2001, July). *Educational achievement and Black-White inequality.* United States Department of Education Office of Educational Research and Improvement, Report 2001-061. Retrieved April 5, 2010 from nces.ed.gov/pubs2001/2001061.PDF - 2001-07-05

Jamelske, E. (2009, March). Measuring the impact of a university first-year experience program on student GPA and retention. *Higher Education: The International Journal of Higher Education and Educational Planning 57*(3), pp. 373 – 391. Retrieved September 8, 2010 from https://connect2.uncc.edu/10.1007/,DanaInfo=dx.doi.org+s10734-008-9161-1 Accession number EJ825726

Janz, J.C. (2004). The retention impact of freshman seminar on students with varying pre-college academic performance (Doctoral dissertation, Marquette University, 2004). *Dissertation Abstracts International,* DAI-A 65/07, p. 2514, Jan. 2005.

Johnson, J.L. (2001). Learning communities and special efforts in the retention of university students: What works, what doesn't, and is the return worth the investment. *Journal of College Student Retention, 2*(3), pp. 219-238.

Jones, W.A. & Braxton, J.M. (2009-2010). Cataloging and comparing institutional efforts to increase student retention rates. *Journal of College Student Retention, 11*(1), pp. 123-139.

Justis, R. (2008, November-December). Higher education: Women take the lead. *InContext, 9*(9). Retrieved April 10, 2010 from http://www.incontext.indiana.edu/2008/nov-dec/1.asp

Kelly, C. (2008). The applicability of the Tinto model of student departure to at risk college students. (Doctoral dissertation, University of Hartford, 2008). *Dissertation Abstracts International,* DAI-A 69/03, Sept. 2008.

Keup, J.R. (2006). The impact of curricular interventions on intended second year re-enrollment. *Journal of College Student Retention: Research, Theory and Practice, 7*(1-2), pp. 61-89.

Koerner, J.J. (2008). Outcomes of student participation in college freshman learning communities. (Doctoral dissertation, Florida Atlantic University, 2008). *Dissertation Abstracts International,* DAI-A 69/11, May 2009.

Kuh, G.D. (2009, Spring). The NSSE: Conceptual and empirical foundations. *New Directions for Institutional Research 141*, pp. 5-20.

Kuh. G.D. (2004). *The National Survey of Student Engagement: Conceptual Framework and Overview of Psychometric Properties.* Indiana University Center for Postsecondary Research and Planning. Retrieved November 7, 2009 from http://nsse.iub.edu/2004_annual_report/pdf/2004_Conceptual_Framework.pdf

Kuh, G.D., Cruce, T.M., Shoup, R., Kinzie, G., Gonyea, R.M. (2008, Sep/Oct). Unmasking the effects if student engagement on first year college grades and persistence. *Journal of Higher Education 79*(5), pp. 540-563.

Lang, D.J. (2007). The impact of a first year experience course on the academic performance, persistence, and graduation rates of first semester college students at a public research university. *Journal of the First-Year Experience & Students in Transition, 19*(1), pp. 9-25.

Laufgraben, J.L. (2005). Learning communities. In M.L. Upcraft, J.N. Gardner, & B.O. Barefoot (Eds.) *Challenging and Supporting the First-Year Student* (pp. 371-387). San Francisco:Jossey-Bass.

Lehning, M. (2008). Impact of an extended orientation program on academic performance and retention (Doctoral dissertation, Kansas State University, 2008). *Dissertation Abstracts International,* DAI-A 69/12, p. 4655, June 2009.

McMillan, J. H. & Schumacher, S. (2001). *Research in education: A conceptual introduction*. New York: Longman.

Miller, J., Janz, J.C., & Chen, C. (2007). The retention impact of a first-year seminar on students with varying pre-college academic performance. *Journal of the First Year Experience and Students in Transition, 19*(1), pp. 47-62

Moore, R. (2004). Pre-enrollment and post-enrollment predictors of the academic success of developmental education students. *Journal of College Student Retention, 6*(3), pp. 325-335.

National Center for Educational Statistics. (2009a). University of North Carolina at Charlotte. *Integrated Postsecondary Data Set, IPEDS Data Center.* Retrieved November 3, 2009, from http://nces.ed.gov/collegenavigator/?q=university+of+north+carolina+at+charlotte&s=NC&id=199139

National Center for Educational Statistics (2009b). College enrollment and labor force status for 2004, 2005 and 2006 high school completers, by sex and race/ethnicity. *Digest of Education Statistics.* Retrieved December 27, 2009 from http://nces.ed.gov/programs/digest/d07/tables/dt07_375.asp

National Center for Educational Statistics (2005). Postsecondary participation and attainment among traditional age students. *Student Effort and Educational Progress Indicator 22.* Retrieved April 6, 2010 from http://nces.ed.gov/programs/coe/2005/section3/indicator22.asp

National Survey of Student Engagement. (2010a). *Reliability: 2008 Internal Consistency.* Retrieved August 3, 2010 from http://nsse.iub.edu/pdf/.../**2008**%20**Reliability**%20Internal%20Consistency.pdf

National Survey of Student Engagement. (2010b). *National Survey of Student Engagement Measurement Scales, Component Items, and Intercorrelation Tables (2008 Data).* Retrieved August 2, 2010 from http://nsse.iub.edu/pdf/NSSE_2006_Scales_Properties.pdf

National Survey of Student Engagement. (2009a). *About the National Survey of Student Engagement.* Retrieved November 7, 2009 from http://nsse.iub.edu/html/about.cfm

National Survey of Student Engagement (2009b). *Validity, predicting retention and degree progress.* Retrieved July 21, 2010 from http://nsse.iub.edu/pdf/psychometric_portfolio/PredictiveValidity_retention_degreeprogress.pdf

National Survey of Student Engagement (2009c). *Reliability: 2008 internal consistency.* Retrieved July 20, 2010 from http://nsse.iub.edu/pdf/psychometric_portfolio/2008%20Reliability%20Internal%20Consistency.pdf

National Survey of Student Engagement. (n.d.). *Benchmarks of effective educational practice.* Retrieved November 7, 2009 from http://nsse.iub.edu/pdf/nsse_benchmarks.pdf

Noble, K., Flynn, N.T., Lee, J.D., & Hilton, D. (2008). Predicting successful college experiences: Evidence from a first year retention program. *Journal of College Student Retention, 9*(1), pp. 39-60.

Noel-Levitz, Inc. (2006, March 2). *Cost of recruiting poll results.* Retrieved April 2, 2010 from https://www.noellevitz.com/About+Us/In+the+News/News+Item/Cost+of+Recruiting+Poll+Results.htm

Nora, A., Barlow, E., & Crisp, G. (2005). Student persistence and degree attainment beyond the first year in college. In A. Seidman (Ed.) *College Student Retention* (pp. 129 – 153). Westport, CT: Praeger.

Orszag, J.M., Orszag, P.R., & Whitmore, D.M. *Learning and earning: Working in college*. Retrieved October 9, 2010 from http://www.brockport.edu/career01/upromise.htm

Pascarella, E.T., Seifert, T.A., Blaich, C. (2010, Jan/Feb) How effective are the NSSE benchmarks in predicting important educational outcomes. *Change 42*(1). pp.16-22.

Pascarella, E.T. & Terenzini, P.T. (2005). *How college affects students.* San Francisco: Jossey- Bass.

Pike, G.R., Kuh, G.D., & Massa-McKinley, R. (2008, January). First-year students' employment, engagement, and academic achievement: Untangling the relationship between work and grades. *NASPA Journal*, *45* (4). Pp. 560- 582.

Potts, G., & Schultz, B. (2008, June). The freshman seminar and academic success of at-risk students. *College Student Journal 42* (2, part B), pp. 647-659.

Rice, R. & Thomas, W. (1989). *The effects of various types of orientation programming upon freshman academic performance and reaction to college.* Paper presented at the Western Regional Conference of the Freshman Year Experience, Irvine, CA. (ERIC Document Reproduction Service No. ED 323443).

Schnell, C.A., & Doetkott, C.D. (2003). First year seminars produce long term impact. *Journal of College Student Retention, 4*(4), pp. 377-391.

Schuh, J.H. (2005). Finances and retention. In A. Seidman (Ed.) *College Student Retention* (pp. 107-127). Westport, CT: Praeger.

Seidman, A (2006). College student retention: A primer. The Center for the Study of College Student Retention. Retrieved September 26, 2009 from http://www.cscsr.or-g/docs/College_Student_Retention_A_Primer_2005_files.pdf

Seidman, A. (2005). *College Student Retention.* Westport, CT: Praeger.

Singer, W. (2003). The role of the campus visit and summer orientation program in the modification of student expectations about college. *Journal of College Orientation and Transition, 10*(2). Retrieved December 23, 2009 from EBSCO Host ERIC. Accession No. EJ674924.

Smith, D.N. & Windham, M. (2009). Comparing student learning outcomes in an independent section of first-year seminar to a first-year seminar embedded in a learning community. *Journalof the First Year Experience & Students in Transition 21*(2), pp. 47-64.

St. John, E., Cabrera, A., Nora, A., & Asker, E. (2000). Economic influences on persistence reconsidered. In J. Braxton (Ed.) *Reworking the student departure puzzle* (pp. 29- 47). Nashville, TN: Vanderbilt University Press.

Starke, M.C. (1994). *Retention, bonding, and academic achievement: Effectiveness of the college seminar in promoting college success.* Paper presented at the Annual Freshman Year Experience National Conference, Columbia, SC. (ERIC Document Reproduction Service No. ED 374741).

StatSoft Electronic Statistics Textbook (n.d.). *Principal components and factor analysis.* Retrieved July 21, 2010 from http://www.statsoft.com/textbook/principal-components-factor-analysis/

Strayhorn, T.L. (2009). An examination of the impact of first-year seminars on correlates of college student retention. *Journal of the First Year Experience & Students in Transition, 21*(1), pp. 9-27.

Tinto, V. (2000). *Taking student retention seriously: Rethinking the first year of college.* Retrieved October 17, 2009 from http://soeweb.syr.edu/academics/grad/higher_education/copy%20of%20Vtinto/files/AssessingRetention.pdf

Tinto, V.(1987). *Leaving college: Rethinking the causes and cures of student attrition.* Chicago, IL: University of Chicago Press.

United States Census Bureau (2006, December 19). Majority of undergrads and grad students are women, census bureau reports. *U.S. Census Bureau News, CB06-186.* Retrieved April 10, 2010 from http://www.census.gov/Press-Release/www/releases/archives/education/007909.html

United States Department of Education (2006). *A test of leadership: Charting the future of U.S. higher education.* Retrieved January 23, 2007 from http://www.ed.gov/about/bdscomm/list/hiedfuture/index.html

University of North Carolina at Charlotte (2009). *Learning communities at UNC Charlotte.* Academic Services Office. Retrieved April 9, 2007 from http://www.lc.uncc.edu

Weissman, J., Magill, B.A. (2008). Developing a student typology to examine the effectiveness of first-year seminars. *Journal of the First Year Experience & Students in Transition 20* (2), pp 65-90.

Whalen, D., Saunders, K. & Shelley., M. (2009-2010). Leveraging what we know to enhance short-term and long-term retention of university students. *Journal of College Student Retention 11*(3), pp. 407-430.

Ziegler, J. (2008, October 29). College tuition rises faster than inflation yet again (update 2). *Bloomberg.com.* Retrieved April 11, 2010 from http://www.bloomberg.com/apps/news?pid=20601103&sid=a.VIge7LL0e0&refer=us

Zientek, R.M. (2008). The impact of themed learning communities on academic performance and retention. (Doctoral dissertation, State University of New York at Buffalo, 2008). *Dissertation Abstracts International,* DAI-A 69/08, Feb. 2009.